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ABSTRACT

Forty studies that have formulated financial standards or indicators for colleges and universities are reviewed. The 40 investigations have been conducted since 1973 and have generated over 300 financial indicators. Information is provided on reasons for performing financial analysis, databases that generate the financial information, theoretical and empirical procedures for selecting indicators, and validation techniques. The review identifies the following purposes for developing financial indicators: research to provide a theoretical framework, financial accounting, federal and state policy analysis, evaluation research, institutional analysis, credit analysis, applied research, future uses, and the national standards debate. The review indicates that the different purposes and uses for financial indicators have resulted in different sets of indicators. A chart shows conceptual frameworks, data sources, and experts for 1973-1978 for the following uses of indicators: determining sector viability, identifying institutional conditions, evaluating public programs, aiding institutional management, and assessing investment risks. A six-page bibliography concludes the document. (SW)

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Technical Report No. 13

# Financial Health Indicators for Institutions of Higher Learning

Paul Brubaker

Prepared by

SAGE
STATISTICAL ANALYSIS GROUP IN EDUCATION

For the

National Center for Education Statistics

**U.S. DEPARTMENT OF EDUCATION**
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TECHNICAL REPORT NO. 13

# FINANCIAL HEALTH INDICATORS FOR INSTITUTIONS OF HIGHER LEARNING: A LITERATURE REVIEW AND SYNTHESIS

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November 1979

# PREFACE

This literature review is intended to assist potential users in their search for promising financial indicators.[1] It is intended to provide background materials in this field for potential researchers and to summarize the status of this specific area of research for those who may be interested in the future policy implications of these efforts.

The citations in this review include the 40 major studies using financial indicators conducted since 1973. A large number of people have contributed to this field, and even more are now continuing the work.

This particular review is limited to literature on financial indicators, which represent few of the many available financial measures. The literature includes published reports, studies circulated between users, and summaries from the two annual working conferences on "Measuring Financial Conditions of Colleges and Universities" cosponsored by the American Council on Education (ACE), the National Association of College and University Business Officers (NACUBO), and the National

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[1] This review does not include the development and use of costing standards, cost information and financial reporting for governing boards. The Costing Standards Committee of the National Association of College and University Business Officers (NACUBO) and the National Center for Higher Education Management Systems (NCHEMS) have substantially contributed to the development of cost information criteria. Major works in this area were reported by George Baughman of the Ohio State University and David Carter, then with the Kentucky Commission on Higher Education, at the Annapolis conference, 1978 (see text below). Financial reporting for governing boards has also been initiated by NACUBO.

Center for Education Statistics (NCES).[2] A chronological listing of the major projects by organization and author is given in Table 1.

The year 1973 was selected as the beginning year for four reasons. First, in that year Congress demonstrated its interest in financial indicators by acting on the recommendations of the National Commission on the Financing of Postsecondary Education (NCFPE). Second, NCFPE's report summarized prior developments in measuring financial conditions.[3] The report was widely distributed, serving as the focus of consensus for the field. Third, NCFPE's use of the Higher Education General Information Survey (HEGIS) signified the widespread availability of this valuable machine-readable database. Fourth, the publication of Audits of Colleges and Universities in 1973 (revised in 1974) by the American Institute of Certified Public Accounts (AICPA) set forth uniform standards for nonprofit financial accounting that have been accepted and subsequently have provided a common basis for communications and statistical comparisons.[4]

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[2] The conference reports may be obtained from the Economics and Finance Unit, American Council on Education, One Dupont Circle, Washington, D.C. 20036.

[3] An excellent summary of selected conclusions in studies (1968-73) of financial distress in higher education by W. G. Bowen, H. Bowen, Cheit, Jellema, Jenny, and Wynn et al. can be found in Appendix C of the report by the National Commission. Chapter 5 of the report, including the summary, was written by Hans Jenny.

[4] Also in 1973, NCES funded the Joint Accounting Group's independent development of supplementary accounting guidelines. As a result of this Group's deliberations, the AICPA publication for auditors was followed by the NACUBO College and University Business Administration (1974), which serves as a guide for business officers, and the Higher Education Manual (1975), a NCHEMS guide funded by NCES which serves users of institutional financial information.

The development and use of financial indicators have evolved as a result of recent pioneering conceptual work in financial theory and analysis. The ultimate progress of financial analysis depends upon a coherent theory of educational financing. Hans Jenny's understanding of how institutions are managed and can be modeled has served as the cornerstone for subsequent development. Dan Robinson and Doug Collier's acceleration of the development of financial reporting methodology and Collier's exploratory work with business officers regarding the analysis of financial health have advanced users' understanding of frameworks for measuring the financial condition of colleges and universities. Kent Halstead's development of the Higher Education Price Index (HEPI) has led to the widespread acceptance of a method for measuring the impact of external events, primarily inflation, on the educational community. Most of the subsequent conceptual developments since 1973 have been elaborations or variations of models advanced by these financial analysts.

Congressional testimony by experienced authorities has also been instrumental in motivating construction of indicators. Panels of experts have convened to assess the condition of institutions within particular sectors and to evaluate relative levels of health or distress indicated by selected ratios. Perhaps the most publicized work in this regard has been the Lupton, Augenblick, and Heyison study (1976) reported in Change magazine.

Despite the interdependence of these developments, a survey of the literature from 1973 to 1978 reveals a conclusion similar to that of the National Commission in 1973. With the possible exception of the

Higher Education Price Index, there is no consensus on the use of financial indicators. However, there has been a major advance in the confidence in indicators used for specific purposes and in the foundation from which these indicators are interpreted. Evolution of these developments has advanced the analysis of postsecondary institution financial condition to the point where currently a widespread, expressed need exists to identify a set of uniformly accepted financial indicators. By supporting research for the development of such indicators for inclusion in The Condition of Education, the federal government has recognized the needs of the variety of users who may benefit by advances in this field. The American Institutes for Research in the Behavioral Sciences (AIR) subcontracted with Systems Research Inc. to prepare this review and was responsible for its final editing and printing. The project has been sponsored by the National Center for Education Statistics of the U.S. Department of Health, Education, and Welfare as part of its Statistical Analysis Group in Education (SAGE) project.

## ACKNOWLEDGMENTS

Recent SAGE activity in the area of financial measures has been a cooperative effort between the National Center for Education Statistics (NCES), the American Council on Education (ACE), the National Association of College and University Business Officers (NACUBO), the American Institutes for Research in the Behavioral Sciences (AIR), and Systems Research Inc. (SR). Considerable assistance in assessing studies and in reviewing this survey has been provided by Carol Van Alstyne, Sharon Coldren, and Nathan Dickmeyer of the Economic and Finance Unit of ACE, by Scott Hughes of NACUBO, and by task director Steven Jung of AIR. This review has benefited from the Financial Measures Project of ACE. Most citations were identified from the bibliography of that project, and the Economics and Finance Unit made copies of the studies freely available. Further, the compilation of "A National List of Current Projects Related to Financial Indicator Development for Colleges and Universities" was instrumental in the identification of the most recent projects and trends in this field.

Many of the authors submitted documents and provided crucial insight through personal communications and review of the draft document. This special effort and interest was especially appreciated.

The views in the report are those of the author and are not those of the National Center for Education Statistics, the American Institutes for Research, Systems Research Inc., or any of the organizations or authors providing materials and comments.

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## Chapter I

## INTRODUCTION

This literature review is an attempt to organize the recent financial indicators research according to several different perspectives. Its approach reflects the realization that different sets of financial indicators exist for each of the different kinds of user agencies, serving their own purposes, research methodologies, and data sources. These differences are outlined in this report.

In December 1973, the National Commission on the Financing of Postsecondary Education concluded that:

> In short, there has been a substantial number of reports issued during the past six years dealing directly or indirectly with the question of financial distress among collegiate institutions. Those who have studied the matter are far from unanimous, however, about the seriousness of the problem and the necessity for governmental intervention. Of special significance is the fact that the literature provides clear evidence that there is no agreement on a uniform definition regarding the nature of financial distress among postsecondary institutions, nor are there generally accepted standards or uniform criteria to ascertain its existence or extent. Thus, a careful review of these studies yields no clear understanding of the extent of financial distress or of its implications for public policy.[1]

Congress, acting upon the conclusions and recommendations of the Commission, deferred the use of financial indicators as a basis for legislation. Since 1973, more than 40 additional major studies have attempted to formulate financial standards or indicators for colleges and universities. (See Table 1 for a chronological list of these studies.) Despite the NCFPE recommendation that "National standard indicators should be developed to determine the relative financial status of the different types of postsecondary educational institutions,"[2] there are still no generally accepted standards or uniform indicators to ascertain financial health.

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[1] National Commission, p. 193.

In fact, upon completion of an initial stage of its Financial Measures Project, the Economics and Finance Unit of the American Council on Education (ACE) concluded that there may well be a need for different sets of financial indicators for the different sectors for postsecondary education.[3] This perspective reflects the bleak prospects for development of uniform criteria.

Prior to using financial indicators for the 1980 edition of The Condition of Education, then, an assessment of the causes for the lack of agreement in this field and of possible mechanisms for attaining future convergence is needed. This was accomplished by analyzing the range of objectives for the 40 studies, the principal uses and users of financial indicators, the data sources, and the methodologies of financial indicator construction and validation. These topics will be briefly introduced here, then discussed in depth in later chapters.

## Purposes and User Groups

Despite the lack of consensus for proven indicators, improved assessment of the financial condition of colleges and universities has

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[2] Ibid., p. 225.

[3] Van Alstyne, pp. 12-13.

Table 1

## A Chronological List of the Major Projects in the Development and Use of Financial Indicators Since 1973

| | Title of Report | Organization | Author | Date |
|---|---|---|---|---|
| 1. | "An Adaptation of Financial Analysis to Higher Education" | NCHEMS | M. Carroll* | August 1973 |
| 2. | "The Determination of Institutional Financial Distress: A Proposal for Decision Making" | NCHEMS | D. Collier* | August 1973 |
| 3. | Financing Postsecondary Education in the United States** | NCFPE* | H. Jenny | December 1973 |
| 4. | The State-Aided Colleges: Financial Profiles - 1969-1973 | NYSCU* | N. Mercer | March 1974 |
| 5. | "Indicators of Financial Distress in Higher Education" | College of Wooster | H. Jenny*<br>G. Wynn | April 1974 |
| 6. | Higher Education Prices and Price Index | NIE (HEPI)* | K. Halstead | 1975 |
| 7. | "Credit Analysis on College and Universities" | SLMA* | R. Henry | May 1975 |
| 8. | "Analysis and Interpretation of Financial Data" | Peat, Marwick, Mitchell & Co. | D. Robinson* | June 1975 |
| 9. | "Classifying Measures of Institutional Financial Strength" | NJDHE | T. Truitt* | August 1975 |

(continued)

[*] Indicates abbreviated project identifier for subsequent references.

[**] Titles of unbound papers appear in quotations, while those of bound reports are underlined.

Table 1 (cont)

| | Title of Report | Organization | Author | Date |
|---|---|---|---|---|
| 10. | The Report of the Regents Advisory Commission on the Financial Problems of Postsecondary Institutions | NYRAC* | N. Mercer | September 1975 |
| 11. | "Capital Financing and Debt Creation by Colleges and Universities" | Citibank | J. Berenyi* | October 1975 |
| 12. | Personal correspondence with Carol Van Alstyne, ACE | Price Waterhouse | M. Gross* | October 1975 |
| 13. | A Study of the Financial Condition of Colleges and Universities: 1972-75 | ACE | L.H. Lanier*<br>C.J. Andersen | October 1975 |
| 14. | First Annual Report on Financial and Educational Trends in the Private Sector of American Higher Education | AAC | H.R. Bowen*<br>W.J. Minter | November 1975 |
| 15. | Dormitory Authority of the State of New York, Research Report | DASNY* (First Albany Corporation) | G. McNamee<br>E. Gibson<br>G. Bullard | November 1975 |
| 16. | "Indicators of Institutional Financial Health" | NCHEMS | D. Collier* | January 1976 |
| 17. | The Very Small College | Ford Foundation | J. Kershaw* | January 1976 |
| 18. | "A Financial Taxonomy" | ACE | P. Smith*<br>C. Henderson | January 1976 |
| 19. | "Development and Application of Measures of Financial Conditions of Colleges and Universities" | ACE | C. Van Alstyne*<br>S. Coldren | January 1976 |
| 20. | A Study of the Causes of the Demise of Certain Small, Private, Liberal Arts Colleges in the U.S. | VPI* | L. Andrew<br>B. Friedman | May 1976 |

(continued)

Table 1 (cont)

| | Title of Report | Organization | Author | Date |
|---|---|---|---|---|
| 21. | A Capacity for Innovation: 1976 Master Plan of the Commission on Independent Colleges and Universities | cIcu* | R. Payton | June 1976 |
| 22. | "The Financial State of Higher Education: | Change* | A. Lupton<br>J. Augenblick<br>J. Heyison | September 1976 |
| 23. | "Response Offered to Change Article on State of Higher Education" NACUBO Business Office. | ACE | C. Van Alstyne | December 1976 |
| 24. | Strategic Policy Changes at Private Colleges: Educational and Fiscal Implications | Columbia TC | R. Anderson* | 1977 |
| 25. | Financial Health of Independent Colleges and Universities in New York | NYTCFPE* | J. Farmer | January 1977 |
| 26. | The Development of Institutions of Higher Education: Theory and Assessment of Impact of Four Possible Areas of Federal Intervention | Harvard* | G. Weathersby<br>G. Jackson<br>E. Jacobs<br>E. St. John<br>T. Tingley | January 1977 |
| 27. | Financing in an Era of Uncertainty | NJCFPE* | J. Lupton<br>D. Reigle | May 1977 |
| 28. | "Factors Related to the Ability of Certain Small, Private Liberal Arts Colleges to Cope with the New Depression in Higher Education" | Stanford Dissertation | W. Wormley* | May 1978 |
| 29. | State Policy Toward Independent Post-secondary Institutions | CPEC* | P. Cullan | June 1978 |

(continued)

Table 1 (cont)

| | Title of Report | Organization | Author | Date |
|---|---|---|---|---|
| 30. | Fourth Annual Report on Financial and Educational Trends in the Independent Sector of American Higher Education | NAICU | W.J. Minter*<br>H.R. Bowen | July 1978 |
| 31. | An Evaluation of the Small College Consortium, 1977-78: A Title III Project | SCC* | C. Toppe<br>P. Brubaker | August 1978 |
| 32. | Problems and Outlook of Small Private Liberal Arts Colleges | GAO* | E. Niemi | August 1978 |
| 33. | Financial Position and Progress of Independent Colleges and Universities in Pennsylvania | ICUP* | J. Minter Associates | September 1978 |
| 34. | A Multivariate Approach to the Analysis of Institutional Financial Conditions | NCHEMS | D. Collier*<br>C. Patrick | September 1978 |
| 35. | "Monitoring the Financial Status of Independent Institutions in New York State" | NYS Monitor* | P. Wing | October 1978 |
| 36. | "Harris Trust and Savings Bank System for Evaluating the Financial Status of Colleges and Universities" | Harris | C.T. Johnson | October 1978 |
| 37. | Financial Position and Progress of Independent Colleges and Universities in Minnesota | ICUM | J. Minter Associates | November 1978 |
| 38. | "ACE/NCES Experimental Project on Financial Health Indicators Using HEGIS Data" | ACE/NCES* | S. Coldren<br>P. Mertins<br>P. Knepper<br>N. Brandt | February 1979 |

(continued)

Table 1 (Cont)

| | Title of Report | Organization | Author | Date |
|---|---|---|---|---|
| 39. | "Current Economic Trends in American Higher Education" | Change | W.J. Minter | February 1979 |
| 40. | "The Bottom Line in College and University Finance" | NACUBO | H. Jenny | February 1979 |

become possible because of advances in management, financial analysis, non-profit accounting, financial data collection, statistics, computerized financial modeling and long-range planning, and financial and economic theory. In many cases, generic enhancements in these fields have been applicable to financial analysis of postsecondary education. Agencies identified in the literature have intensified the demand for progress by sponsoring, conducting or participating in specialized studies. These efforts can be classified into seven reasons for performing financial analyses:

1. Economic and financial theorists along with college and university officers have sought a common comprehensive model or theoretical framework for understanding financial operations and administration.
2. Accountants and auditors have generated more uniform reporting systems to assist in the decision-making process and in the evaluation of financial management.
3. Policy analysis for federal and state governments has been one major impetus for developing and refining financial health indicators.
4. Indicators have been used by evaluators to assess the impact of federal aid that has been granted directly to developing institutions.
5. No less urgent, but more reserved for the financial world than the educational milieu until recently, has been use of indicators by private financiers for the purpose of credit analysis.

6. Institutions that have realized the need for more sophisticated managerial methods have been aided by consultants who have developed models for institutional self-analysis.
7. Applied research stemming from academia has expanded the methodologies introduced by the more pragmatic analysts in the public and private sectors.

It is not surprising, then, that the 40 investigations performed for one or more purposes have generated over 300 financial indicators.

Financial indicators for colleges and universities have been used by at least five different kinds or levels of organizations. They have been used by governments and economists to determine the viability of particular sectors, by agencies to identify institutional conditions and to assess the impact of programs on such conditions, by institutions themselves for managerial improvement, and by private enterprise to assess financial strength for investment decisions.

These classifications resemble the purposes, but there are variations that are the effects of significant differences along three dimensions. Trade-off decisions involving timeliness, cost, and reliability often explain both the differences between purposes and uses and the variation of selected sets of financial indicators among studies of different magnitude.

Even prior to the National Commission's recommendation to establish national standard indicators, requests were received from all types of user groups to develop the "Dow-Jones" of higher education. The arguments for uniform standards are presented along with their counter-arguments.

## Data Sources

Empirical research using financial measures has primarily relied upon data from the Higher Educational General Information Survey (HEGIS) or some derivative of it. Nine other sources have been used by the cited principal investigators: EDSTAT, DATACORE, Higher Education Data System (HEDS), audited financial statements provided by the institutions, Fiscal Operations and Applications (FISCOP and FISCAP), Title III applications, the Higher Education Panel (HEP) survey, the Association of Independent California Colleges and University's Measures of Financial Condition, and related special surveys created by researchers. The data used in each of the projects are described along with the author's evaluation of data quality and currency, if available.

Many authors and principal users refused to accept existing financial data as accurate. This refusal can also be traced to concerns of time, cost, and reliability. In the past, HEGIS and other data were made available many months after they were collected. Manual aggregation of data either by pooling HEGIS surveys or by conducting special surveys usually was found to be uneconomical. Accumulated errors from survey interpretation, reporting, and data processing also served to reduce the confidence of those familiar with the processes.

Three developments during the 1973-78 period of review have improved user satisfaction. The first was simply the availability of HEGIS in machine-readable form within six to nine months after data collection. The second improvement was the establishment of uniform, nonprofit (educational funds) accounting principles by the AICPA. In addition, uniform categories for reporting revenue and expenditure data were developed by the Joint Account Group (JAG) and subsequently accepted and endorsed by NCHEMS, NACUBO, and the AICPA. Generally accepted accounting principles and the uniform revenue and expenditure categories were incorporated with the HEGIS revision in 1974-75 and have substantially improved the reliability of the survey. Third, John Minter's standardized methods for obtaining information from audited financial statements have improved both data reliability and timeliness for analysis.

In summary, there is a growing consensus in the fields of accounting, college and university business operations, and research for common data definitions. As a result, subsequent indicators should be enhanced by growing data accuracy and by the ensuing implementation of trend analysis.

## Selection of Indicators

Research reports commonly provide descriptions of the methodology used for achieving results; however, only one-half of the cited investigations reported the procedures used for selecting their indicators. Four distinct types of methodologies for selecting indicators were identified. A *theoretical* approach was used by analysts who constructed a priori models of the educational firm and then chose indicators accordingly. *Cluster analysis* techniques have generated smaller sets of indicators from the universe of available ratios and trend data. *Expert testimony* was used to capitalize on the subjective experiences of economists, business officers and private financial analysts. The comparative approach was often used to select from indicators used for other studies. The variations of these four approaches are accounted for with the descriptions of the methodologies for 21 projects.

According to the literature, no objectively preferable method exists. Considerations of time and magnitude of the intended effort have influenced most selection decisions. In the early 1970s, theoretical methods served as baselines. Since then, experience of financial officers has led to questions about the available models and the use of more pragmatic proxies. Objectively acceptable statistical procedures have been criticized for lacking a coherent rationale. While waiting for a better model or an understanding of what the current indicators really signify, researchers have, since 1975, experimented with their own hypothetical indexes and borrowed indicators from business and other comprehensive studies, such as Bowen-Minter and the ACE financial measures project.

## Validation Techniques

Validation attempts to verify techniques for general usage are among the most essential contributions to the continued development and use of financial indicators.

Two types of techniques were used by the reviewed studies. First, empirical validation processes--both predictive and retroactive--were used to match indicators to the outcomes of actual events. Several statistical procedures were used in the course of empirical validation attempts. Expert testimony was also used to validate some financial indicators. Some projects used some combination of these approaches.

All validation efforts have occurred since 1976. In the short time period since then, considerable criticism and subsequent improvements have emerged. For example, the Change magazine validation approach, using expert judgments and discriminate analysis, even though extensively criticized by Van Alstyne of ACE (1976) and others, has led to attempted improvements in a recent NCHEMS study by Collier and Patrick (1978).

## Chapter II

## PURPOSES FOR DEVELOPING FINANCIAL INDICATORS

Congress was unable to resolve all of the points at issue in the debates that preceded the passage of the Higher Education Amendments of 1972. Therefore, it added to the act a provision establishing a National Commission on the Financing of Postsecondary Education and charging the Commission with the development of an analytical framework to be used to review existing financial programs and with the task of recommending new financing methods and policies that would most effectively serve the national interest.

Hans Jenny, a pioneer in the development of theoretical frameworks for financial indicators, authored "The Incidence of Financial Distress Among Institutions of Postsecondary Education," the fifth chapter of Financing Postsecondary Education in the United States (1973). The basis for the section on developing a capability for measuring financial distress was a literature survey of the period Earl Cheit called the "New Depression in Higher Education" era (1968-73). During this period, primitive financial indicators were used predominantly to assess current and projected degrees of financial distress in higher education. Such analyses were crucial for public policy consideration by all levels of government. Preceding the projects cited in this review were studies of sector viability and conditions in specific institutions, such as Jellema (1971 and 1973) for private; Hudgins and Phillips (no date) for state universities and land-grant colleges; Jenny and Wynn (1972) for private liberal arts colleges; the Commission on Independent Colleges and Universities (1972) for New York and independents; and Lombardi (1973) for community colleges. Few analyses were conducted in the areas of institutional or financial management, although "ineffective management and administration" was consistently identified as one of the five causes of financial distress.

The Commission concluded that "no generally accepted standards or uniform criteria were available to ascertain the existence or extent of financial distress among institutions of postsecondary education."[1] Consequently, the Commission foresaw that if financial analysis were to become a useful tool for policymaking, then it was necessary to better identify the characteristics of indicators and then develop their analytical requirements.

Without consensus on uniform criteria, Congress deferred the possibility of using financial indicators for policy analysis standards. Subsequently, researchers have developed seven other types of uses for financial analyses and have generated over 360 financial indicators. This chapter is a review of the similarities and differences of studies within each of the eight use or purpose categories listed in Table 2.

## Research, Theoretical Framework

The NCFPE report identified three kinds of indicators needed for analyzing institutional financial condition.

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[1] National Commission, p. 225.

## Table 2

## Financial Indicators Projects by Intended Purpose and by Type of Data Aggregation

| Project | Purpose | Scope | Sector Carnegie Class | Date |
|---|---|---|---|---|
| Carroll | Research, Theoretical | U | All | 1973 |
| Collier | Framework | Fed/St | All | 1973 |
| Truitt | | U | All | 1973 |
| Jenny | | Inst. | All | 1979 |
| Robinson | Financial Accounting | Inst. | All | 1975 |
| Gross | | Groups | All | 1975 |
| NCFPE | Policy Analysis: Federal | Fed. | All | 1973 |
| Jenny (-Wynn) | | Fed. | (III) | 1974 |
| Lanier-Andersen | | Fed. | All | 1975 |
| HEPI | | Fed. | All | 1975 |
| Bowen-Minter | | Fed. | Private | 1975 |
| Minter-Bowen | | Fed. | Independent | 1978 |
| Kershaw | | Fed. | Private | 1976 |
| VPI | | Fed. | (III.II) | 1976 |
| Smith-Henderson | | Fed. | Private | 1976 |
| Van Alstyne-Coldren | | Fed. | Private | 1976 |
| GAO | | Fed. | Private | 1978 |
| *Change* | | Fed. | All | 1976 |
| Van Alstyne | | Fed. | All | 1976 |
| ACE/NCES | | Fed. | All | 1976 |
| Minter | | Fed. | All | 1974 |

KEY:
U = Universal
St. = State
Fed. = Federal
Inst. = Institutions

(continued)

Table 2 (cont)

| Project | Purpose | Scope | Sector<br>Carnegie Class | Date |
|---|---|---|---|---|
| NYSCU | Policy Analysis: State | St. | New York | 1974 |
| NYRAC | | St. | New York | 1975 |
| cIcu | | St. | NY Indepen. | 1976 |
| NYTCFPE | | St. | NY Indepen. | 1977 |
| NYS Monitor | | St. | NY Indepen. | 1978 |
| NJCFPE | | St. | New Jersey | 1977 |
| CPEC | | St. | California | 1978 |
| ICUP | | St. | PA Indepen. | 1978 |
| ICUM | | St. | Minnesota | 1978 |
| Harvard | Evaluation Research | Fed. | Title III | 1977 |
| SCC | | Fed. | Title III | 1978 |
| Collier | Institutional Analysis | Inst. | Private | 1976 |
| Collier-Patrick | | Inst. | All | 1978 |
| SLMA | Credit Analysis | U | All | 1975 |
| Berenyi | | U | All | 1975 |
| DASNY | | St. | NY | 1975, 1978 |
| Harris | | U | All | 1978 |
| Anderson | Research, Applied | Fed. | (III.II) | 1977 |
| Wormley | | St. | CA. Indepen. | 1978 |

- Indicators of Institutional Financial Status
  - Program and budget information
  - Enrollment and student data
  - Financial data and related statistics
  - Quality of institutional management

- General Enterprise-Wide Indicators
  - Price index for institutions of postsecondary education
  - Price index for capital expenditures of institutions
  - Price index for consumers of educational services

- Indicators of External Conditions
  - General economic indicators
  - Postsecondary education public policy indicators
  - General demographic indicators

Concurrent with the investigation of NCFPE were conceptual developments by staff of the National Center for Higher Education Management Systems (NCHEMS). Two drafts were prepared for an August 1973 national workshop on financial distress.[2] Maryanne Carroll wrote "An Adaptation of Financial Analysis to Higher Education," and Doug Collier provided "The Determination of Institutional Financial Distress: A Proposal for Decision Making."

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[2] A third conceptual model developed largely by NCHEMS staff will become available in 1979. Marilyn McCoy (NCHEMS) and D. Kent Halstead (NIE), Financing Higher Education in the Fifty States: Interstate Comparisons for FY 1976, U.S. Department of Health, Education, and Welfare, National Institute of Education, U.S. Government Printing Office, Washington, D.C. A prepublication review states the following:

> This study presents a systematic construct or model of data relating to State and local government financial support of higher education. The framework and graphical layout assists in understanding the component elements affecting institutional financing, their interaction, and serve as an aid in appraising performance levels through use of interstate comparisons. Sixteen measures are reported in four areas: public enrollments, government finances, other revenues, and expenditures. Revenues and expenditures are detailed by sector and five public institutional levels. The measures are interrelated by formula which permits quantified assessment of the consequences of alternative input values. Each measure is expressed in relative terms to provide comparability, and also as an index relative to the U.S. average.

Carroll's stated purposes were to adapt to higher education the conventional tools of comparative financial analysis as applied to business and to propose a framework upon which an approach to higher education financial analysis could be developed so that the tool of comparative analysis could be utilized meaningfully. The paper includes discussions, definitions, ratios, and procedures of analysis upon which "industry-wide" standards could be developed. Her four-step approach for determining the status of financial health allows for optional analyses of the components of general operating status (demand and personnel utilization) and/or monetary status (working capital, source and use of funds, etc.), or an integrated examination. With such a basis, one could employ from three to 43 indicators to determine the relative financial condition of a university or sector(s).

Collier's proposal was an approach that could be applied to any particular problem (but primarily to federal or state policy analysis), using the Carroll document as a basis. The approach for the determination of institutional financial distress was based upon a conceptual model comprised of three elements: analysis by sectors, primary and secondary indicators, and determination of improvement or deterioration.

A total of ten primary and secondary indicators were selected for the three areas of analysis: working capital, fixed position and demand.

In response to the diversity of approaches and increasing need for consolidation, T. D. Truitt offered a method for organizing any large amount of available institutional data to facilitate both analysis by policy researchers and self-analysis by institutional officers. "Classifying Measures of Institutional Financial Strength" (1975) is neither a theory of financial fitness nor an analytical model. It is a process that permits the inclusion of "everyone's ideas of what could be a useful 'measure' of financial strength and that leads to the compression of a large amount of data into a manageable set of indicators while leaving the making of critical judgments to the investigator."[3] Truitt's classification system includes nine dimensions of strength and 82 indicators: investment (10 indicators), management (6), utilization (6), quality (10), demand (10), efficiency (14), stability (13), independence (6), and flexibility (7).

"The Bottom Line in College and University Finance" (February 1979) was an attempt to augment the traditional funds accounting principles with managerial benchmarks. Jenny's "bottom line" concept was the first theoretical framework for college and university finance that was specifically developed to produce cash-flow analyses more easily. The byproduct of this effort was the identification of several new financial indicators that many institutions have been tracking but that have not been available for peer comparisons.

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[3] Truitt, p. 2.

Jenny translated from business to education the criteria of economist Alfred Marshall. Marshall made the distinction between firms that experience revenues sufficient to defray variable costs and those that have adequate income to cover variable and fixed costs. His conclusion was that a business will continue to be viable only if it earns over time enough to pay its variable plus fixed costs. Jenny's translation was that over long periods of time revenues must be sufficient to cover the annual operating budget and to discharge the explicit and implicit obligations that arise from the institution's past capital investments.

The Committee on Finance of the College of Wooster produced a reporting format (displayed in the article) that allows for the analysis of adequacy of current revenues. The four-phase approach begins with a listing of all budgeted and budgetable revenues and all budgeted operating expenditures excluding any capital elements that yield "net revenues from operations." Phase two, subtraction of interest on debt, yields a net revenue, before capital charges. Phase three introduces the concept of capital charge--year-end expenditure elements (e.g., new equipment, plant improvements, etc.) that can be capitalized in the balance sheet and elements that pertain to past capital investments (e.g., debt repayment). The subtotal of capital charges is then deducted to yield a "surplus/deficit before other sources." Phase four includes the addition of other revenues such as endowment income above payout and unrestricted revenues to produce the "bottom-line," "additions to surplus/deficit before transfers."

The supplementary indicators that Jenny identified can be referred to as the inflation and productivity effects. These indicators or adjustments are as follows: the inflation effect of the endowment market and of plant investments, the enrollment effect, student loan delinquency, current and constant dollar endowment returns, and total constant dollar change in fund balances with and without plant funds. A cash flow analysis from/for students was highlighted by Jenny as an early warning signal device for schools with an increasing or large dependence on tuition income and/or public (student aid) funds. The "FTE financial" ratio, the measure of tuition income per FTE student, highlighted in "Financial Viability in Postsecondary Education: Data Requirements for Sound Policy Formulation and Control during the 1980s and 1990s" (Jenny, 1978) was illustrated with this analysis.

## Financial Accounting

Uniform standards for financial accounting and reporting to the field of higher education became available with the publication of the AICPA guide for auditors, Audits of Colleges and Universities (1973), NACUBO's College and University Business Administration (1974) for institutional business officers, and the NCES Higher Education Finance Manual (1975) for planning and budget offices and other managers. These standards plus advances in electronic data processing streamlined data collection so that a significant change in the comparability of institutional data became possible by 1974.

Daniel Robinson, a partner in the accounting firm of Peat, Marwick, Mitchell & Co., capsulized the difficulties of adapting the business enterprise model of analysis to higher education in "Analysis and Interpretation of Financial Data" (1975). Although empirical attempts with the model adapted from business had already been advanced, Robinson provided an analysis that was both theoretically acceptable and supported by the application of generally accepted principles of accounting. His argument was simple: "Since business enterprises do not use fund accounting, and since they are concerned with net income or loss for the year, the borrowed ratios do not fit."[4] As temporary substitutes, he selected an incomplete list of financial warning signals--21 indicators that fit the principles of non-profit accounting. The indicators were defined to signal deteriorating trends in admissions, registration, student aid expenditures, academic administration and balance sheet. Included were such key indicators as "increasing percentages of unfunded student aid expenditures," "decreasing amount of unrestricted current and quasi-endowment funds," "increasing reliance on interfund borrowing from current funds for plant expenditures," and "decreasing value of endowment funds per FTE student." Robinson added suggestions for the presentation of balance sheets in comparative form (showing current fiscal year-end amounts compared with those for the same date a year earlier) and expansions of the statement of changes in fund balances to include four more line items: unrestricted, restricted expendable, restricted for investments and loans, and net investment in plant.

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[4] Truitt, p. 2.

Malvern Gross of Price, Waterhouse and Co., author of Financial and Accounting Guide for Nonprofit Organizations, has outlined four general principles behind the development of indices for groups of institutions. Consistent with Robinson's suggestion was the implementation of year-to-year percentage change as a trend index and the use of changing ratios among revenue components such as student aid and current revenues. Gross recommended the median as a preferred measure of central tendency, creating such indicators as "median tuition and fee revenues as percentages of educational and general revenues per full-time equivalent (FTE) student." He also proposed that a financial "common denominator" be constructed--the mean average dollar amount per FTE student.

## Policy Analysis: Federal

Following the report of the NCFPE, at least ten major projects were directed toward national concerns of postsecondary education. Most of these incorporated enrollment and financial data and related statistics for the purposes of assessing sector viability or the condition of institutions. Only a few projects attempted to establish indicators for the quality of institutional management.

These studies can be grouped according to the four needs that prevailed beyond the National Commission's investigation. First, the gap left by the Commission's lack of assessment of the impact of inflation upon financial conditions was addressed by both private and public analysts. The Ford Foundation funded exploratory work by Hans Jenny and G. Richard Wynn and the American Council on Education sponsored a comprehensive investigation, A Study of the Financial Condition of Colleges and Universities: 1972-1975, conducted by Lyle Lanier and Charles Andersen (1975). Concurrently, the National Institute of Education published Higher Education Prices and Price Indices (Halstead, 1975). The latter traced price movements from 1961 through 1974 for the basic expenditure components of educational services. Second, the "bottom-up" demand by institutions for unbiased analytical views on unquestioned premises prompted associations and foundations to continue to assist with financial health studies. Such a request from the president of a "very small" college led to the Ford Foundation's commissioned report, The Very Small College (Kershaw, 1976). Third, the "top-down" request by President Gerald Ford for assessment of the condition of small, private liberal arts colleges reinforced commitments to these "valuable national resources." President Ford's April 9, 1975 letter to United States Commissioner of Education Terrel Bell generated studies by the American Council on Education (Smith & Henderson, 1976) and by Virginia Polytechnic Institute and State University (Andrew & Friedman, 1976). Fourth, the continuing need for comprehensive analyses of the "universe" was stimulated by the availability of machine-readable HEGIS data. The debate surrounding the Special Report in Change (Lupton, Augenblick, & Heyison, 1976) led to the large-scale generation of descriptive information of higher education using financial indicators (61 ratios) and HEGIS data (for 3,038 institutions) which was reported by ACE and NCES (1979).

Indicators of external conditions, factors over which an institution has no control, yet to which management must adjust (i.e., general economic, public policy and general demographic indicators), were considered in a number of influential analyses.[5] Reports on these studies are outside the scope of this review.

Inflation impacts on labor intensive sector. Since financial health analyses highlight the examination of data over time, correction factors have been developed to make dollar amounts comparable. In a sense, then, inflation indicators have become financial health indicators. And, the Higher Education Price Index has been published most consistently and has become widely accepted, perhaps even the most accepted indicator. Jenny (1974) reported to the Pennsylvania Association for Higher Education that inflation in postsecondary education had been much more severe than in the economy as a whole. Because of its labor intensive nature (an average of 65 percent of postsecondary expenditures are on faculty salaries), inflation in postsecondary education has a very specialized structure. He based his conclusions on analysis of 48 private colleges (Jenny & Wynn, 1972), using indicators such as changes in faculty salary, library books and materials, and utilities. Many additional indicators for enrollment, financial, and program variables were suggested as a model for determining the strength/weakness of an institution and whether the current status was one of distress or turnaround. Of special note is the recommendation that the three major components--wage, price, and student aid cost inflation--not be combined into one comprehensive index. The wage deflator, Jenny pinpointed, offers an opportunity to reach conclusions on how institutions are managing their personnel component. This could be done because the deflated personnel compensation series could provide not only the constant dollar data but also an indication of whether personnel costs were cut back, leveled off, or continued to grow.

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[5] For example, see Halstead's Tax Wealth in Fifty States (1978) which reports the capacity of states to support public higher education. Halstead has advanced a method for computing the wealth and well-being of each state and the extent to which that wealth is tapped for educational purposes. Although this effort has been widely used by budget analysts and planners, it has been used less frequently as an indicator of financial health.

Lyle Lanier and Charles Andersen's ACE Special Report expanded the analysis of the effect of inflation on the financial condition of different types of institutions (363 schools in nine Carnegie Commission categories) to account for the 1973-74 extraordinary increases in wages and prices. Private institutions generally were hit harder by inflation than those in the public sector. For 1973-74, five of the nine classes of private institutions had negative growth rates in terms of constant-dollar expenditure per FTE student, while two of seven classes of public institutions had negative growth rates.

The overriding message of this study was that more than improved cost-revenue relationships were required for reversal of the economic trends that have dominated the national economy. In 1975, many leaders in higher education accepted the belief that "cost increases cannot be offset by productivity gains in the fashion of goods-producing industries--or service industries that can substantially automate their operations--without intolerable impairment of the quality of its educational products."[6] Lanier and Andersen concluded, however, that such a belief had to be more thoroughly tested through systematic research at several levels.

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[6] Lanier and Andersen, p. 79.

While Jenny (-Wynn) focused on inflationary effects on the private sector and the ACE study identified general trends for a three-year period, Halstead's Higher Education Prices and Price Indexes presented complete descriptions of several indexes together with index values and price data for fiscal year 1961 through 1974. The 1978 supplement provides price index data for educational and general expenditures for fiscal years 1971 through 1978. Yearly reports are scheduled shortly after the fiscal year to which the latest data refer. The purpose of these publications has been to report higher education price information on a continuing basis until a more formal effort of this kind is initiated by the federal government or by interested private organizations.

The reports measure the effects of inflation on current operations, research and development, physical plant additions and tuition, room and board price trends. The Higher Education Price Index (HEPI) signifies the change in prices paid by institutions for a fixed group of inputs purchased for educational and general operations less sponsored research.[7] Between 1961 and 1974, the level of professional salaries (58 percent of HEPI) paid by institutions doubled, growing steadily at a compound annual increase rate of 5.4 percent, while the Consumer Price Index (CPI) increased only 56.5 percent or 3.5 percent annually.

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[7] G. Richard Wynn's dissertation, Inflation Indicators in Liberal Arts Colleges (1974), provided a complete price index for liberal arts colleges that is compatible with HEPI. Wynn used flexible weighting each year, whereas Halstead used standard weighting for all years. The problem with the liberal arts college price index is that there have been no annual supplements to keep the index current.

The Research and Development Price Index (R&DPI) removes the effects of inflation from college and university research expenditures by converting actual to constant dollars. Halstead found that because R&D involves somewhat less personnel compensation than current operations, the rate of increase for the R&DPI has been slightly less than that of the HEPI.[8]

The price of new construction increased since 1967 at an annual rate of 7.75 percent which was even more than the 6.25 percent annual increase in HEPI. At the same time, tuition increases have averaged between 7 and 8 percent yearly for all types of institutions in both public and private sectors except at two-year colleges, where the rate was 4.5 percent. Halstead felt that this uniform rate of increase indicated that colleges and universities collectively raised tuition to respond to inflation and rising costs, not as a matter of individual policy or competitive strategy.

Continuing programs by associations and foundations. The associations have a history of doing research on the financial conditions and management of colleges and universities. Many of these efforts were sponsored and/or funded by the foundations, including the financial condition studies of the Carnegie Commission which appeared between 1968 and 1973. Assessments of the private sector have been aided by the enterprising activities of Howard R. Bowen and John Minter.

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[8] The National Science Foundation has funded the Ohio State University to develop inflation indicators for research universities. In March 1979, the NACUBO Business Office issued a report by Scott Hughes on the university price index calculation system (UPICS).

By 1975, they had refined the means for obtaining more reliable data on the financial condition of the independent sector of higher education. Initially under the auspices of the Association of American Colleges (AAC), their purpose was "to monitor the progress of private colleges and universities regularly and to provide reliable and timely information for the use of government officials, educators, donors, students, faculty and other persons or groups interested in private higher education."[9] By continuing their analyses annually, they have been able to record changes and define trends that are unavailable from "snapshot" assessments.

Private Higher Education: First Annual Report on Financial and Educational Trends in the Private Sector of American Higher Education (Bowen & Minter, 1975) did not confirm the dire prediction of the "depression era" (1968-1973) that most private colleges and universities were essentially defunct and on their way to oblivion. The evidence located by Bowen and Minter was between the two extremes of "defunct" and "prosperous." More specifically, they found that total enrollments held steady except for those of the less selective liberal arts colleges, which experienced a steady decline between 1971-72 and 1974-75. Very little retrenchment was found. In fact, academic and student-service programs expanded, although much of the expansion may have been defensive, i.e., designed to attract and hold students and to adjust to changing times. Revenues increased slightly for the same period, but there were signs of financial strain: "Dependency on private gifts to balance budgets increased slightly, and the percentage of total expenditures devoted to instruction and departmental research declined."[10] Balance sheets indicated a steady hold on assets, liabilities, and net worth. Yet, among liberal arts colleges interfund borrowing increased significantly. Bowen and Minter's analysis of individual institutions revealed sizeable variation and the identification of "serious trouble" for 27 percent of private institutions. The recurrent theme of the report--the enormous staying power of private colleges and universities--remarkably changed the tone of subsequent studies of the private sector of postsecondary education.

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[9] Bowen and Minter, p. iii.

"Financial and Educational Trends in the Private Sector of American Higher Education" were continued by Bowen and Minter in 1976 and by Minter and Bowen in 1977. The sponsorship for the 1978 report shifted from AAC to the National Association of Independent Colleges and Universities (NAICU), and the change is reflected in the title, _Independent Higher Education: Fourth Annual Report on Financial and Educational Trends in the Independent Sector of American Higher Education_.

Minter and Bowen expanded their database not only to include 1976-77 but also to embrace the trends of research universities and two-year colleges. Findings for the _independent_ sector _as a whole_ included a slow but steady upward trend in enrollment for all six types of institutions. The change was in the mix of students, with decreasing proportions of full-time undergraduate students and increasing proportion of graduate, professional, and part-time (mostly adult) students. Even though enrollment was rising slowly, the dependence on student aid indicated a worsening financial state. The 1977-78 increase in faculty compensations "nearly kept pace with inflation but fell considerably short of average increases in compensation for the general labor force."[11]

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[10] Ibid., p. 76.

According to self-reports, conclusions about the general condition of educational programs were that overall performance was not deteriorating, that little important retrenchment was taking place, and that the level of confidence and morale has remained high. Although current revenues and expenditures "approximately kept pace" with the combined increases in the Consumer Price Index and in enrollment, there was a slowly increasing percentage of revenue from tuition and a decline in the percentage from the federal government and endowment income.

With regard to the condition of institutions individually, Minter and Bowen concluded that the proportion of institutions in a "precarious position" increased in 1976-77 from 20 to 34 percent. The chief concern of the authors for the independent sector was that the recent good performance could partly be the result of a "slow and seemingly inexorable exhaustion of capital." Besides the depletion of reserves or gifts that should have gone into endowments, and deferred maintenance and replacement of plant and equipment for which no reserves had been accumulated, the authors cited the potentially damaging consumption of human capital through inability to keep faculty and staff compensation growing in proportion to the wages and salaries of the national labor force.

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[11] Minter and Bowen, pp. 108-109.

The tendency has been to assume that the very small colleges (fewer than 750 students) are too small to "make economic sense." Until economist Joseph Kershaw of Williams College conducted a pilot study of three such colleges (which contain 4 to 5 percent of the nation's undergraduate enrollment), little had been done to test the "peril point" hypothesis. According to the Carnegie Commission on Higher Education, colleges with less than 1,000 students run a risk of failing to take advantage of the economics of scale. Kershaw's application of indicators to the three small colleges in comparison with Jenny and Wynn's data for 48 private colleges led (see above) to his conclusion that "there is nothing inherent in the smallness of an institution that accounts for financial troubles."[12] Kershaw's position on economics of scale includes the corollary that the primary determinant of cost-per-student is actually what income happens to be, i.e., a non-profit institution will spend whatever money it has. Almost the sole source of income for the three very small colleges, however, has been tuition and fees--over 90 percent in each case, well above the average level for "demised" colleges in the VPI study (see below).

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[12] Kershaw, p. 22.

Public aid to privates? President Ford's concern for the plight of small, private liberal arts colleges resulted in a search for solutions to the school's problems. Higher education experts at Virginia Polytechnic Institute and State University (VPI) studied the causes for the demise of these schools (Andrew & Friedman, 1976). They reviewed the historical and current role of small private colleges, developed case studies on 10 of the 59 that closed or merged between 1970 and 1975, analyzed the financial ratios and other characteristics of "demised" and live "invisible colleges," and prepared a position paper on governmental intervention.[13]

The VPI study identified the current role of the small, private liberal arts college: to provide an environment with a unique value orientation, size, and quality differentiations. The authors cited both internal and external causes for demise. The four internal factors were (1) serious confusion about the college's mission, (2) inability to obtain accreditation, (3) an insufficient financial base, and (4) lack of administrative or managerial expertise. The nature of the small college makes it vulnerable to economic stress, competition, and social change. Competition from public higher education has been fostered by state and federal policies and by the tuition gap between the private and public sector, which has increased over recent years.

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[13] Andrew and Friedman used Astin and Lee's (1972) term "invisible colleges" because the small, relatively unselective and non-complex-in-structure Liberal Arts II colleges in the VPI sample were "almost synonymous" with the 494 colleges in Astin's study (small less selective and relatively obscure private institutions--the invisible colleges).

The analysis of financial ratios of demised and live invisible colleges was intended to establish a statistical profile of the two groups as a means for predicting financial troubles. Sixteen ratios were used to discern the differences. Significant differences between the two profiles include the following: (1) 38 of the 59 demised schools had full-time enrollments (FTEs) of less than 500, while most live colleges had FTEs between 500 and 1,500; (2) demised colleges' current fund expenditures per-current-fund revenues were in the red (1.06) while live colleges were clearly in the black (0.986); (3) the ratio of student aid expenditures per-student-aid revenue was 18.3 for the demised colleges and only 3.8 for the live ones, reflecting the increased financial aid pressures generated by the need to attract additional students; (4) education and general (E&G) tuition revenue per FTE student was $2,428 for demised and $1,559 for live colleges. This supports the economic theory that there are diminishing returns for increasing tuitions beyond certain competitive levels; and E&G total expenditures per FTE student were $4,059 and $2,407, respectively, for demised and live colleges, which seems to verify the allegation of management or control inadequacies attributed to demised colleges. Use of discriminant function analysis to predict financial directions for institutions resulted in a 69.5 percent successful classification of actual demised colleges and 86 percent accuracy with live invisible colleges. This study illustrates the potential value of using financial indicators for a prediction model, but demonstrates the limitations of the particular set of 16 selected ratios.

The U.S. Office of Education also sponsored the American Council on Education's special analyses of the conditions and needs of the private sector. Patricia Smith and Cathy Henderson (1976) prepared the report, "A Financial Taxonomy."

"A Financial Taxonomy" was developed for analyzing the patterns of current fund revenues and expenditures of institutions and gaining insight into the potential impact of certain public policy options. Over half of the nearly 700 small, private liberal arts colleges were found to have had high dependence on tuition revenue and no sizable annual giving, endowment income, or government appropriations. On a per-FTE-student basis, federal student aid grant revenues constituted 37 percent of the total student aid revenues of private institutions and 57 percent of the same for publics. Because of the diversity of the financial profiles of private institutions, no specific public policy was judged to have uniform impact. Generally, Smith and Henderson concluded that public policy can assist institutions having great dependence on tuition and private giving by providing increased student aid at the federal and state levels and by increasing stimuli for private giving through the federal tax laws.

The ACE Financial Measures Project was undertaken to develop, test, and apply comprehensive measures of the financial conditions of American colleges and universities. Van Alstyne and Coldren (1976) compared industrial to educational accounting principles and financial ratios, citing four types of performance measures for higher education:

liquidity and flexibility, leverage, contributions from operations, and quality (compared to industry's "profitability"). Their assessment of contemporary indicators confirmed their initial impression that indicators "are not adequate for the purposes to which they are applied." The economists recommended the need for trend analyses and interpretation of financial information in broader, substantive contexts including, but not limited to, current comparisons with other groups of institutions, pursuit of educational or non-educational objectives, and anticipated future conditions, based on rates of flow. From this expanded framework, the authors identified ten possible explanations for the opposing conclusions of the Lanier-Andersen ("deteriorating") and the Bowen-Minter ("improving") reports. Four explanations--grouping of the institutions, method of aggregation, period covered, and adjustments for enrollment and inflation--appeared to account for apparent differences between the two prior studies.

At the request of Congress, the General Accounting Office (GAO) made its own investigation, The Problems and Outlook of Small Private Liberal Arts Colleges (1978). The GAO study attempted to portray actions being taken by troubled private liberal arts II schools to remedy their condition and what effect federal and state programs have had on the schools' financial status. The Seattle-region effort managed by Edward Neimi concluded that most officials of troubled small, private liberal arts colleges (3) were "guardedly" optimistic about the financial future of their institutions. However, in addition to projected declining enrollments, general economic conditions were perceived to adversely affect the future financial prospects for these schools. The conditions cited were the impact of increases in payroll taxes due to changes in social security legislation, minimum wage increases, growing energy costs, and the increasing costs to meet federal social program regulations. The GAO recommended that Congress require the Secretary of Health, Education, and Welfare to assess, periodically, the financial condition of postsecondary education institutions, considering standard indicators such as those suggested by NCFPE. Principal reviewers of the GAO report, including DHEW, agreed that any increases in assistance to institutions experiencing financial distress should be provided through increases in present student assistance programs rather than through direct emergency type institutional assistance.

Attempts to aggregate the universe. As part of their research for the New Jersey Commission on Financing Postsecondary Education (see NJCFPE in "Policy Analysis: State" below), Lupton, Augenblick, and Heyison attempted to develop a systemwide analysis to measure the impact of policy choices on institutional financial condition. They anticipated the possibility of aggregating data from all postsecondary institutions. They noted limitations of previous analyses, such as focus on subpopulations (private or state institutions), which restrict generalization. And, as aggregation studies often rediscover, most smaller studies require significant amounts of data that are not routinely collected by colleges and are therefore difficult to gather and compare. Using HEGIS data, Lupton et al. accumulated comparative information for 2,163 institutions. A statistical procedure (see Chapter IV) was used to select 16 key variables, including four trend variables and ten financial ratios.

The publication of their work, "The Financial State of Higher Education: A Special Report," in Change magazine (September 1976) triggered much controversy. The annual supplements that had been intended by Change never materialized. The authors illustrated how almost one-half of all academic institutions could be considered to be in an unhealthy condition. When compared with publicly supported institutions, private colleges were found to be much more "unhealthy"--86.6 percent of the private institutions analyzed fell into the two unhealthy categories. And yet, the general tightening of state budgets also resulted in the identification of 13.5 percent of the public institutions in the unhealthy categories. Three times as many institutions with less than 1,000 students were unhealthy than were institutions with more than 10,000 students. Public two-year community colleges were found to be the healthiest. Perhaps most significantly, the authors concluded from the 1972 through 1974 data that stop-gap measures to aid the independent sector have been ineffective.

One of the most notable responses to the Change article was Carol Van Alstyne's memorandum (October 1976) to Stephen Bailey, then Vice President of ACE. Van Alstyne, one of the eight experts who helped define fiscal "health" for the Lupton study, identified ten weaknesses of the study's approach to aggregation. The shortcoming with the most pervasive consequence is that the fundamental selection and interpretation of the 16 key indicators reflects reliance on raw statistical results, not on a coherent understanding of the financial operations of higher education institutions. Not only do schools use different reporting systems that obscure conditions described by ratios, but different types of institutions operate differently. Van Alstyne argues that instead of putting all institutions into a single statistical universe, colleges and universities should first be grouped by financial structure and academic mission and then meaningful indicators should be selected to make comparisons within and among groups. Most of the other criticisms are statistical in nature and are referred to in Chapter V.

The ACE/NCES Experimental Project on Financial Health Indicators Using HEGIS Data (1979) moved in the direction outlined by Van Alstyne in her 1976 memorandum. Van Alstyne, along with principal investigators Sharon Coldren of ACE and Paul Mertins and Norman Brandt of NCES, designed the project to use existing HEGIS data to determine how they can be used to analyze institutional financial conditions.

The joint, heuristic project yielded three major outputs in an effort to stimulate further investigation. A merged data tape of selected elements from five HEGIS surveys conducted for the year 1974-75, with formats for 1975-76 and 1976-77, has been made available to analysts. The second output was a peer selection process that will allow chief executives to compare their own institution's financial condition and performance with that of similar empirically identified institutions. The third output was the calculation of 61 selected ratios by type and control, and by state. Descriptive statistics of these ratios for 3,038 institutions are currently available for state higher education planners and policymakers.

In response to the probems associated with data aggregation, John Minter demonstrated his "trend consensus" approach in Change (February 1979). The purpose of the study was to develop sets of economic indicators that could periodically measure economic prospects for institutions. Seven indicators (enrollments, total current revenue, total employment, capital contract commitments, expendable reserves, voluntary giving, and surplus of revenues over expenditures) were used in a national survey of 187 representative colleges and universities.

As described more completely in the chapter on methodology, trend consensus is concerned only with the directions of change, not its magnitude. Consequently, generalizations are about institutions as units-of-measure, not aggregated students or dollars. The dominant finding of Minter's study was that economic growth was slowing down. Although all seven of the indicators showed positive trends for 1977-78, the strengths of those trends diminished for six indicators projected for 1978-79 (overall negative projections were experienced for surplus revenues and expandable reserves). For example, the overall trend for total current revenue was strongly positive in FY 1978. It is predicted to be even stronger in FY 1979. However, these trends are attenuated by the impact of inflation, which is reflected in higher tuitions and appropriations (which guarantee an increase in numbers but not necessarily purchasing power).

## Policy Analysis: State

Many states regularly employ financial indices for legislative and other decisionmaking processes. No review of these voluminous analyses could be exhaustive or just to all representatives. Several studies, though, can illustrate the historical development and the current state-of-the-art for measuring the financial condition of colleges and universities within a single state. Five reports are used to sketch the evolution of financial indicator utility in the state of New York, from the assessment of schools receiving "Bundy" funds (1969-1973) to the state education department's 1977 evaluation of the status of institutions in financial difficulty. The state of New Jersey's Commission on Financing Postsecondary Education study of New Jersey institutions in relation to others in the nation also focused considerable attention on an inductive approach to policy analysis.

Finally, the California Postsecondary Education Commission report, State Policy Toward Independent Postsecondary Institutions, and the John Minter Associates 1978 publications, Financial Position and Progress of Independent Colleges and Universities in Pennsylvania (October) and Financial Position and Progress of Independent Colleges and Universities in Minnesota (November) reflect the most comprehensive purposes and latest methodologies currently being used.

New York studies. The techniques, criteria, variables, indicators, and parameters that are developed and employed in the analyses of financial condition and distress are not peculiar to the New York scene, even though they are being applied to New York institutions. In a sense, then, the following historical narrative describes particulars of New York and the generic events of the other states.

Unlike the preference of Congress for widespread subsidy of students rather than institutions, New York state has been granting general unrestricted financial aid to its private colleges and universities since legislation was adopted by the 1968 legislature. The Select Committee on the Future of Private and Independent Higher Education in New York State, chaired by McGeorge Bundy, recommended policy provisions that were to preserve the strength and vitality of the state's independent institutions. In March 1974, the state education department published The State-Aided Colleges: Financial Profiles - 1969-1973 (NYSCU). This report extended the portrait of the financial condition of institutions receiving Bundy aid and provided further analysis of their financial "health."

It was determined that Bundy aid has become an increasingly important factor in meeting the current operating expenses of private colleges and universities in New York state. Without Bundy aid in 1972-73, 67 of the 88 eligible institutions would have experienced operating deficits. With the aid, 40 institutions still reported deficits for the year. With such financial conditions and accompanying exogenous influences (e.g., continuing inflationary trends and a more restricted enrollment pool than previous anticipated), the state education department report concluded that financial stability for most private higher education institutions would only be achieved through rigorous cost control and fiscal management and through continued, dependable financial assistance from federal and state governments.

The Report of the Regents Advisory Commission on the Financial Problems of Postsecondary Education (NYRAC) was prepared by a commission chaired by Nathan Pusey and staff directed by Norman Mercer (September 1975). In response to Board of Regents' requests, it developed and recommended policies that might apply in addressing the financial problems of New York state's institutions of higher education, especially for "maintaining and strengthening a comprehensive system." Besides general inflation and enrollment projections, other sources generating increasing financial problems since the mid-1960s were identified: plateauing income, demands for additional and different educational programs, expansion of programs for and admissions of economically and educationally disadvantaged students, and a large expansion of facilities heavily financed by debt. The impact of these developments was projected to produce greater problems in New York state because of (1) the sheer size of the higher education enterprise in the state; (2) the rapid and tremendous growth and development of two public higher education systems, superimposed upon an already large and diversified population of private institutions; and (3) the population trends of the state, including a significantly lower growth rate than the rest of the nation. The Commission recommended that the Regents seek an overall statewide policy for financing higher education: that the distinction in public financing between public and private institutions be one of degree. Specifically, the policy stated that the state should narrow differences in net tuition costs to students attending public and private institutions so that students choose institutions that best meet their needs without being unduly influenced by differences in costs of attendance and by the distribution of public subsidies.

The New York Commission on Independent Colleges and Universities (cIcu is the preferred way of displaying its acronym) has, as part of its commitment to the concept of the Regents' unitary sovereignty over all segments of New York's higher education system, submitted three master plans to the Regents. In its 1976 Master Plan of the Commission on Independent Colleges and Universities, cIcu identified 32 of 190 New York institutions studied as being "in deep distress" based on declining enrollments and 22 institutions that had long-term debt exceeding their annual income. The master plan suggested that declining enrollment was due in part to a decreasing share of New York students and in part to the decreasing number of high school graduates. The full-time equivalent student enrollments in independent institutions had declined from 62.6 percent of the total enrollment in 1960 to 37.7 percent in 1975, but subsequently increased to 40 percent in 1976. The Commission proposed changes in the state law: to lower the tuition cost barrier for students who preferred to enroll at independent institutions and to encourage more disadvantaged students to enroll at these institutions, which have a lower tax levy cost and higher productivity.

The Temporary Commission on the Future of Postsecondary Education in New York (NYTCFPE) contracted with James Farmer of Systems Research, Inc. to more precisely assess the extent of financial distress in independent institutions. Financial Health of Independent Colleges and Universities in New York (January 1977) illustrates how six selected, but not universally accepted, indicators were used to assess financial health.[14] The report concluded that the financial condition of the independent sector should be monitored closely to determine if additional state assistance is required, since factors affecting the financial condition could change rapidly.

Following up this recommendation under the direction of Norman Mercer and Paul Wing, the state education department refined procedures for "Monitoring the Financial Status of Independent Institutions in New York State" (October 1978). The main purpose of the financial monitoring project has been to protect the interests of students, faculty, staff, and other constituencies of the institutions--primarily the students. These procedures respond to several policy concerns: that the diversity of educational opportunities be maintained and that institutions in or headed for difficulty be identified, so that assistance and guidance could be provided. Six indicators were chosen for a preliminary determination of the financial condition. After secondary analysis, case studies of the institutions found to have been in serious difficulty were submitted to the Commissioner for his review. The Regents Guidelines for Commissioner's Procedures in Addressing Cases of Higher Educational Institutions Experiencing Financial Distress (1977) specify the procedures for the consequential decisions. Basically, each troubled institution is expected to produce a plan for addressing its problems.

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[14] David Spence's 1976 doctoral dissertation "The Development of Optimal Indices of Health for the Small Liberal Arts College" also employed arbitrary but precise working definitions of financial health. Spence's use of "deficits for three or more years" and other criteria contributed to a more precise conception of "health," which parallels the work Farmer did for the New York independents.

Needs of state agencies promote innovations with indicators. The 1976 Change article was an outgrowth of research for the New Jersey commission on Financing Postsecondary Education (NJCFPE). The Commission was charged with two broad tasks. The first was to promote quality education throughout the state. Policies were sought accordingly to promote access to appropriate opportunities and to distribute the costs of education in a socially equitable fashion. The second broad task was to design a system that would maintain institutional stability and be consistent with public policy.

To conduct reliable analyses of the impact of policies on the financial condition of New Jersey institutions, comparisons against national norms for healthy institutions were sought. In the absence of existing norms, the Commission staff generated those publicized in Change by using a statistical procedure, discriminant analysis. This marked the first attempt to arrive at policy from a predominantly empirical approach.

Of 16 selected indicators, the two most indicative of stability were trends in undergraduate and graduate full-time enrollments. Three selected ratios allowed for similar evaluations of financial stability: (1) current fund revenues per current fund expenditures, (2) academic mission expenditures per E&G expenditures, and (3) tuition and fees per student aid revenues. For all five indicators, the New Jersey schools showed improved health compared to prior years.

The California Postsecondary Education Commission (CPEC), under the direction of Patrick Callan, conducted a comprehensive, mandated study of independent colleges and universities to (1) determine past and projected annual levels of state aid to independents; (2) develop criteria for assessing the financial condition of these institutions; (3) recommend policies for delivery and criteria for determining state assistance; and (4) assess the degree to which state aid will in the future result in a net savings to the state by diverting students to independent institutions.

Since the analysis on financial conditions of independent California institutions was technically developed by John Minter, the chapter reports findings using many of the same indicators found in Bowen-Minter and Minter-Bowen; net revenue ratio, contribution ratio, E&G expenditures per student in constant dollars, debt service coverage ratio, debt exposure ratio and net tuition and fees revenue. The independent sector was declared to have been successful in maintaining student enrollments during the past seven years, although selectivity in admissions may have declined slightly. Liberal arts colleges demonstrated the largest degree of financial strain in their current fund operations, with reports such as the dimunition of alumni interest and financial contributions. Almost every type of institution reported losing ground in the maintenance and improvement of facilities and equipment.

Of the seven recommendations in State Policy Toward Independent Postsecondary Education, two are remarkable for the possibility of establishing financial measures. First, it was recommended that the maximum amount of the California Grant Scholarship award available for students choosing to attend an independent institution should be adjusted annually to reflect (1) the impact of inflation, (2) the aggregate financial need of individuals seeking access to and choice among postsecondary alternatives, (3) the scope and impact of existing federal and institutional student aid programs, and (4) changes in the undergraduate educational costs in public postsecondary institutions. Second, the Commission was requested to monitor the financial condition of the institutions and report annually to the legislature and the governor. In the preparation of this assessment, several financial indicators were recommended as the basis for policy recommendations, including changes in net revenue ratio, rate of growth in salaries, changes in revenues from tuition and fees, and changes in net tuition and fee revenues.

The most current developments by John Minter Associates for state policy analysis are exemplified by the Financial Position and Progress of Independent Colleges and Universities in Pennsylvania (September

1978). In the absence of authoritative judgments of financial conditions, Minter has initiated a procedure for observing the financial "position" and "progress" of each college relative to the average position and progress of a reference group. For Pennsylvania, he determined the general financial "position" of an institution by combining measures from five indicators: net assets, total revenue, endowment funds balance, total asset coverage of total liabilities, and current ratio. The general financial "progress" was calculated using changes in the four latter indicators plus changes in net revenue ratio, tuition and fee revenue, gift revenue, and enrollment. The composite position and progress scores were calculated using conventional Z-scores. This technique has been used for reports to seven other states as well as to governing boards of colleges supported by the Methodist Church and the United Church of Christ.

The Minnesota report introduced two new features, which Minter believes broaden the coverage of the total picture. He has added formats for interpreting the consolidated funds flow and the statement of changes in the institution's financial position. Institutional data have been extracted from the statement of changes in fund balances and recoded in a JMA funds flow statement which identifies total new revenue resources to the institution for all fund groups, how these resources were spent, and the exchange of assets and transfers within the fund groups. The statement of changes in financial position is the consolidation of information extracted from the JMA funds flow statement. Minter claims that this feature makes it possible to perceive what causes the institution's total financial condition to change and the direction of this change.

## Evaluation Research

Title III of the Higher Education Act of 1965 is one of the two remaining federal programs to support institutions directly (Land Grant support being the other). Thus it is not surprising that Title III evaluations have been the major source of financial indicator usage in the evaluation research field. The objective of the Strengthening Developing Institutions (Title III) Program is "to provide assistance to developing institutions that demonstrate a desire and a potential to make a substantial contribution to the higher education resources of the nation but which, for financial and other reasons, are struggling for survival and are isolated from the main currents of academic life."[15] The goal is for these funds to allow developing institutions to move into the "mainstream" so that they might reasonably compete for students and external financial resources.

George Weathersby and a team of researchers at the Harvard Graduate School of Education were contracted by the U.S. Office of Education, Office of Planning, Budgeting, and Evaluation, to assess the impact of Title III using database estimation techniques. Their findings were published in The Development of Institutions of Higher Education: Theory and Assessment of Impact on Four Possible Areas of Federal Intervention (January 1977). The foci of the evaluation grew out of two concerns: how does one conceptualize developmental sequences for institutions of higher education? and if such sequences exist, how does outside financial assistance alter the rate at which institutions progress through these sequences? Since Title III did not collect measures of structural development, the team was unable to reach any conclusions about this central concern. They did employ several measures used for eligibility criteria (FTE enrollment, full-time enrollment percentage of faculty with master's degrees, average faculty salary, percentage of students from low-income families, total E&G expenditures, E&G expenditures per FTE, and volumes in library) to assess the levels of activity undertaken by institutions. They concluded that there was no reason to assume that the levels of activity undertaken by an institution necessarily relate to its location on some pattern or sequence of development. Increasing budgets, student enrollments, or any other activity need not, the Harvard team projected, cause a change in the pattern of institutional development.

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[15] Office of Planning, Budgeting, and Evaluation, p. 288.

Toppe and Brubaker (August 1978) examined the mid-point progress of the four-year Small College Consortium (SCC), a consortium comprised of 54 Basic Institutional Development Program institutions. SCC staff provided technical assistance based on assessments of the unique needs of each college. Six indicators of financial health were selected to evaluate the impact of technical assistance in such areas as planning, management information systems, fiscal management, and recruitment/admissions.

SCC institutions with fewer than 1,000 students (39) increased their enrollment by 6.6 percent compared to a decline of 1.9 percent by their peers as determined by a sample of National Association of Independent Colleges and Universities. E&G expenditures per student for the 54 institutions were cut back in real dollars after the first full year of implementation and E&G expenditures per E&G revenue went from red to black for the first time in at least two years. Tuition and fees (T&F) per E&G revenue (68.3 percent) and T&F per student aid income both increased, reflecting either an increased dependence on income from students or changes in reporting student financial aid. The value for the ratio "student aid expenditures per student aid income" moved closer to that of the "live colleges" reported in the VPI study. Using distress levels similar to those constructed by James Farmer and Paul Wing, three institutions were identified as having two or more indications of distress besides declining enrollment.

## Institutional Analysis

One of the goals of the National Center for Higher Education Management Systems (NCHEMS) is to design, development, and encourage the implementation of management information systems and databases including common data elements in institutions and agencies of higher education that will facilitate exchange of comparable data among institutions.[16] Toward this end, policy analyst Doug Collier has extended his earlier theoretical work to include practical guides for analyzing institutional financial health. His Indicators of Institutional

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[16] Higher Education Finance Manual, p. i.

*Financial Health* (January 1976) describes an approach that provides a general picture of a single institution's condition. *A Multivariate Approach to the Analysis of Institutional Financial Condition* (Collier & Patrick, 1978) represents a preliminary report on an approach used to identify and test indicators of strong and weak financial conditions.

Collier and Patrick developed the approach in consultation with several business officers representing private institutions that were actually experiencing financial difficulties. Their framework for analysis consisted of four key areas of focus and twelve indicators to quantify them. The areas (the number of ratios) and their major ratios are:

1. The ability of the institution to attract and retain students (3)

   $$\frac{\text{number of students admitted}}{\text{number of students matriculated}} \qquad \frac{\text{opening fall enrollment of seniors}}{\text{opening fall enrollment of freshmen}}$$

2. Indicators of potential financial problems (4)

   operating surplus or deficit = current funds revenues - current funds expenditures

   $$\frac{\text{mandatory transfers}}{\text{unrestricted assets}}$$

3. Ability to respond to financial problems (2)

   investment yield on endowment fund (percentage)

   $$\frac{\text{unrestricted assets}}{\text{total assets}}$$

4. Factors to monitor when dealing with financial problems (3)

   faculty ranking on (AAUP) salary scale

   $$\frac{\text{expenditures for plant renewal and replacement}}{\text{total plant assets}}$$

The Multivariate Approach was the product of the first year of a two-year project to develop a validated set of indicators that could add precision to the debate of what financial conditions should be. Three steps were completed in the first year. A framework was developed to reflect six dimensions of the financial condition of one individual postsecondary institution. Indicators were then identified for each of the six dimensions. Subsequently, indicators have been constructed and tested using HEGIS data.

Financial independence was measured by analyzing the dispersion of revenues received across the range of possible revenue sources. Revenue drawing power represented the overall ability of the institution to attract revenue relative to other similar institutions. Financial risk was defined as the potential for financial difficulties which is inherent either in the institution's capital structure or in the way it carries out its operation. Relative endowment yield and interest expense per total expenditures were two of four indicators for this dimension. Revenue stability described the variability over time of the institution's sources of revenue. Collier and Patrick arrived at three measures of financial flexibility: (1) total unrestricted revenues per total revenues, (2) total fixed expenses per total expenditures, and (3) cash per total assets. The final dimension of the framework uses the average fund addition to the five fund sources to indicate the total reserve strength of the institution.

## Credit Analysis

Enrollment declines, knowledge explosions, and skyrocketing costs have forced colleges and universities to approach external sources for financing current operations and fixed assets. The number and kinds of credit analyses performed by external agencies of current and potential clients has increased correspondingly. Such analyses are not as straightforward as those of regulated institutions (e.g., banks). The financial risk of a postsecondary institution is not protected by a lender of last resort such as the Federal Reserve Bank. Consequently, agencies such as the Student Loan Marketing Association, First National Citibank of New York, Harris Trust and Savings Bank of Chicago, and the First Albany Corporation of the State of New York have accelerated the state-of-the-art for measuring financial conditions for business purposes.

Robert Henry of the Student Loan Market Association (SLMA) produced an inter-office memorandum highlighting the issues of credit analysis of colleges and universities (May 1975). He outlined the significant factors that an analyst should consider and recommended an analysis program to examine the factors and reach a credit decision. The three types of factors he examined were (1) quality of student loans, (2) financial status of the school, and (3) non-financial measures. The financial status of the school should be analyzed over the past five years and projected for the next five using nine factors: liquidity (he cited seven indicators), plant fund (three indicators), endowment fund (three), student aid (three), auxiliary revenues minus expenditures, sensitivity to enrollment fluctuations (T&F as a percentage of total current revenues), outsiders' perception of the institution (gifts), current operations (four), and planning and budget (three). Among the non-financial measures were percentage of enrollment in high cost programs, tuition relative to local or similar institutions, and percentage attendance at meetings of the governing board. One of the recommendations by Henry was that the SLMA analyst investigate the usefulness of outside information sources including banks, insurance companies, other lenders or purchasers of the debt of schools, state and local educational authorities, the U.S. Office of Education, and both Standard and Poor's and Moody's Investor Services, which rate some debt issues of colleges and universities.

John Berenyi produced some special notes on "Capital Financing and Debt Creation by Colleges and Universities" (1975) while he was with the First National Citibank of New York. His purpose was to speculate on the future of capital markets and to present a listing of financial indicators of college and university capacity to support debt issues. From the usual set of indicators used by capital markets and bond rating agencies (e.g., operating ratio, debt ratio, interest safety margin), Berenyi provided their equivalents in the higher education sector: debt per student, debt service coverage, endowment per student, ratio of applications to acceptances, enrollment trends, and relative tuition levels.

The Dormitory Authority of the State of New York (DASNY), with $2.16 billion in outstanding debts, is the second largest of the New

York state agencies. Each of the Authority's 111 bond issues to private colleges and universities requires a judgment as to the investment merit of the institution. Similarly, bonds issued under public programs ultimately require an assessment of the state's overall financial situation. The First Albany Corporation's research reports of the Dormitory Authority of the State of New York (November 1975, and the April 1978 update) represent the most sophisticated efforts by an external agency to measure financial conditions.

The 1975 report gave a pessimistic view of the financial future of many of New York's private colleges and universities. It cited trends in the institutions' enrollment patterns (including "regional percent change in high school graduates"), operating deficits, dependence on state aid, and the relation of endowment to debt and to total operating revenues. The authors carefully noted that many external factors were considered and substantial judgment was used. Also, they pointed out that quality of the debt instrument may be different from the financial health of the institution.

Harris Trust and Savings Bank of Chicago uses a 100-point questionnaire to assess potential accounts. C. Thomas Johnson, author of "Harris Trust and Savings Bank System for Evaluating the Financial Status of Colleges and Universities," pooled the knowledge of several authors cited herein to construct a five-component framework for the Harris system: (1) enrollment trends, (2) educational program, (3) revenues and expenditures, (4) assets and liabilities, and (5) student financial aid.

Indicators have been identified for each of the five sections. The evaluation system begins with data collection for the last five fiscal years and the expected future trend for each of the indicators. Points are then awarded for each indicator. For example, one of the revenue and expenditure ratios, tuition and fees per educational and general expenditures, has two criteria for point awards. If the value for the ratio is greater than the average value, then 0 points are awarded if the trend is increasing, 1 point if it is stable, and 2 points if the trend is decreasing. If the value for the ratio is less than average, then 2 points are awarded for an increasing trend, 1 for stable, and 0 for a decreasing indication. The range of scores for the whole instrument is from 12 to 100 with an average of 57.5. The system had not been field-tested as of this writing so neither data on nor validation of the system are available.

## Research, Applied

Project designs originating within academic institutions often have broad scopes expanding beyond the limitations of more pragmatic, focused studies like the NYSCU study of "Bundy" aid. As explained in more detail in the chapter on uses, issues of time, cost, and reliability usually dictate these differences. Richard Anderson of Columbia Teachers College and Wayne Wormley of Stanford's School of Education are two authors who asked global questions of special-purpose colleges. Anderson examined environmental and financial/operating trends of single-sex and religiously-oriented colleges. Wormley used both quantitative analyses and qualitative interview techniques to produce five case studies for his dissertation, "Factors Related to the Ability of Certain Small, Private Liberal Arts Colleges to Cope with the New Depression in Higher Education."

The purpose of Anderson's Strategic Policy Changes at Private Colleges: Educational and Fiscal Implications (1977) was to expand the dimensions of policy discussion. In his opinion, too few policy analyses bridge educational and financial concerns. Using an integrated methodology, he found that colleges that expanded their missions increased enrollments at the expense of campus morale and community feelings. Most mission expansions were made under financial duress, not for educational reasons. The decrease in number of the special purpose colleges prompted Anderson to make several recommendations that would, if enacted, promote the diversity of institutions.

Wayne Wormley wrote his dissertation at Stanford University under the direction of Professor Lewis Mayhew. He attempted to identify the factors that would account for the ability of colleges and universities to respond successfully to the "new depression in higher education." He sought evidence of reversals in the deficit position of most institutions, the amount of time it took to accomplish this task, and the overall record of survival of the industry as a whole during and subsequent to this period. Wormley wanted to expand the amount of research available on those vital issues and compare his findings with those of Cheit, Andrew, and Friedman.

He applied both quantitative analytical and case study techniques to the financial position of five member institutions of the Association of Independent California Colleges and Universities. From the list of 300+ indicators assembled by Van Alstyne and Coldren of ACE, Wormley chose three trends significant to continued operation of the institution: (1) performance of financial operations as evidenced by the history of operating surpluses/deficits between 1966-67 and 1976-77; (2) enrollment as evidenced by changes in FTE (declines in three or more successive years and/or changes in the mix of students, i.e., full-time, undergraduate, etc.); and (3) percentage of E&G component of the operating budget supported by the varous sources of revenues. He found that management, mission, leadership, and historical "accident" were common elements accounting for the ability of the five colleges to cope with financial difficulty. Also, he found that the rise in net tuition and fee revenues and the use of short-term borrowing against future revenues were additional strategies that significantly aided financial operations.

## Future Uses

James Farmer stated in the ACE/NCES report that state higher education agencies are likely to be the first extensive users of financial indicators.[17] While there has been some dissatisfaction with monitoring programs, state agencies are familiar enough with their state's institutions to make necessary adjustments in the financial condition data and to interpret the results in light of the known mission of each institution. Thus, these comprehensive statistical summaries are likely to be produced by more states as the concern about education expenditures grows.

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[17] Coldren et al., p. 8.

The federal government might implement a set of financial indicators if it could be assured that the indicators were reasonably valid.[18] These indicators could be used at two levels. First, the indicators could be used in summary form as part of NCES statistical reporting. Second, the indicators for individual institutions could be used in conjunction with federal funding of institutions.

Evaluators may be able to use indicators along with trend data to measure the impact of public programs and/or the implementation of strategic planning by institutional management. Validation of the sensitivity of selected indicators in Collier and Patrick's study and refinements in the 1979 SCC evaluation will be key tests for the ability to make this type of cause-effect conclusion.

Institutional managers, also, will have to gradually test the validity of financial indicators. It is too early to predict whether financial indicators will become self-sufficient and thereby supplant other techniques, or whether they will merely supplement some of the more traditional financial analyses. However, properly devised indicators could allow an institution to determine if its financial condition is only a reflection of change within the education sector or whether the institution is significantly different from comparable institutions.

The degree of success of Jenny's cash-flow model will be indicative of the magnitude of breakthroughs in financial management assessment, both by private investors and institutional managers. This model may provide more accurate proxies for the business world's tests for liquidity and equity positions. At least, this interpretation of the financial mechanics of a postsecondary institution, so often still an enigma under the fund accounting approach, may lead to a more obvious set of uniform trends and ratios for financial analysis.

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[18] Ibid., p. 9.

## The National Standards Debate

Increased agreement on the value of particular indicators will create elaborations of these usages along with more flexible practices in each of these increasingly more interdependent domains. The argument for a more immediate national index (like the Dow-Jones) is that financial indicators would vastly improve assessments of the educational sector's viability, and relations with other sectors that display confidence in shared symbols and that are accustomed to acting promptly in accordance with rapid fluctuations in conventional indices. Standard measures would subsequently allow analysts to make and communicate assessment of the conditions of institutions and even provide assessments of the outcomes of policy changes. Increased usage of financial indicators could lead to more stability for institutional managers. Uniformity within the field could also provide more knowledge and confidence for investors and donors. In short, the position is that whatever is potentially sacrificed by the selection of an acceptable paradigm at the expense of some precision can be more than offset by opportunities created when different types of managers finally interface with common sets of tools and language.

Again, the factors of timeliness, cost, and reliability are integral in the discussion of the trade-offs involved.

Central to the concerns of Minter and Bowen and others in the forefront of this field is the urgency in obtaining financial analyses. An early warning system consisting of reliable and up-to-date information about their constituency is a matter of considerable importance to most users.

The literature shows that private investors and private colleges and universities prefer current data to precise-but-dated information. And, since their decisions have had a time-value, they have paid the additional costs to get needed data.

The countervailing responses include questions of validity, reliability, and cost: the hesitancies to aggregate data from non-comparable institutions and to provide formulas that may be misused. Hans Jenny has articulated the reluctance to hastily select indicators for comparisons since the ratios may not get at the heart of the problem.[19] Since translating business environment principles to education has been difficult, Jenny and others have resisted premature use of ambiguous standards. Their argument is supported by the known information and the resistance of small schools to be analyzed along the same dimensions as larger ones and vice versa.

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[19] Jenny's "Improving the Conceptual Framework for Measuring Financial Conditions Using Institutional Management Data" in ACE's Financial Measures Project: Measuring Financial Conditions of Colleges and Universities: 1978 Working Conference, pp. 2-3.

The other kind of caveat is that of the economist who develops indicators for a stated, but limited, purpose and then faces the possibility of having them used by administrators who do not have the resources to develop their own criteria. This possibility exists when, for example, a study to improve financial management for institutions is used to determine whether institutions are eligible to receive aid or funds or other support.

## Chapter III

## DATA SOURCES AND EVALUATIONS OF QUALITY AND CURRENCY OF DATA

Data used in financial measures projects have been obtained from sources ranging from the Higher Educational General Information Survey (HEGIS) to special surveys such as the one conducted by the U.S. General Accounting Office (GAO), to reports completed for other branches of government such as the Fiscal Operations (FISCOPs) and Applications (FISCAPs) reports completed for the student financial aid offices of USOE. Some studies have used audited financial statements provided either by institutions themselves or by private firms like John Minter Associates. The purpose of this chapter is to describe the sourcesed used and the author's assessment of the quality and currency of data.

### Studies Utilizing Higher Education General Information Survey (HEGIS) Data

The first comprehensive Higher Education General Information Survey (HEGIS) reported data for FY 1965-66. The prupose of HEGIS has been to collect basic information on all the higher education institutions in the country. Included in the files are the characteristics of the institutions, the number and characteristics of the faculty and students, degrees conferred, and the current fiscal status. The institutional finance survey, for which 1965-66 data are available, provides information on current funds, physical plant assets, physical plant indebtedness and endowment.

information on current funds, physical plant assets, physical plant indebtedness and endowment.

As can be inferred from Table 3, the Harvard evaluation of the Title III program was the first attempt to create a comprehensive database from HEGIS and other sources. The team merged tapes from HEGIS, the Council for Financial Aid to Education (CFAE), a special survey of 1,775 Title III-eligible institutions, the Office of Civil Rights (OCR) faculty and staff data, and the Title III application and awards forms. The USOE fiscal operations and applications forms for 3,351 postsecondary institutions were also used to obtain expenditures and related statistics for federal student-aid programs.

St. John, Tingle, and Gallos (in Appendix C of the Harvard study) began their description of the database with a review of limitations they encountered--the primary one being that HEGIS, CFAE, and OCR questionnaires were not intended to provide indicators of institutional development. The principal limitations of the HEGIS and other data that affected the Title III study, according to the researchers, were difficulties in separating "source" and "use" of reported revenues, different methods for calculating FTE enrollments, and the lack of complete reporting by institutions.

The National Commission on Financing Postsecondary Education also constructed its own tape for analyses using primarily HEGIS data. It used data from all institutions that filed HEGIS reports from 1968 through 1972. From the HEGIS data, it was difficult to conclude whether public or private colleges and universities were experiencing more financial distress. The absence at that time of a wage and price index

## Table 3

## Data Sources for Financial Indicators Projects by Period of Analysis and Number of Institutions Studied

| Source | Period | Number of Institutions | Project |
|---|---|---|---|
| HEGIS | 1966-67 - 1973-74 | | Harvard |
| | 1968-79 - 1971-72 | All | NCFPE |
| | 1970-71 - 1976-77 | 82 | CPEC |
| | 1972-73 - 1975-76 | 95 | NYTCFPE |
| | 1972-73 | 544 | VPI |
| | 1972-73 | 2,809 | Smith-Henderson |
| | 1974-75 | 3,038 | ACE/NCES |
| | 1971-72 - 1975-76 | 1,641 | Collier-Patrick |
| EDSTAT | 1971-72 - 1973-74 | 2,163 | *Change* |
| DATACORE | 1972-73 - 1976-77 | 95 | NYTCFPE |
| | 1973-74 - 1974-75 | 109 | cIcu |
| HEDS | 1966-67 - 1976-77 | 145 | NYS Monitor |
| Audited Financial Statements Provided by Institutions | 1969-70 - 1974-75 | 100 | Bowen-Minter |
| | 1969-70 - 1977-78 | 135 | Minter-Bowen |
| | 1969-70 - 1972-73 | 88 | NYSCU |
| | 1973-74 | 221 | NYRAC |
| | 1972-73 | 363 | Lanier-Andersen |
| | 1966-67 - 1976-77 | 5 | Wormley |
| | 1964-65 - 1967-78 | | |
| | 1971-72 & 1974-75 | 40 | Anderson |
| | 1973-74 - 1974-75 | 82 | CPEC |
| | 1973-74 - 1976-77 | 73 | ICUP |
| | 1974-75 - 1976-77 | 17 | ICUM |
| Fiscal Operations/ Applications | 1971-72 - 1973-74 | 3,351 | Harvard |
| Title III Applications | 1970-71 - 1973-74 | 1,192 | Harvard |
| Higher Education Panel (HEP) Surveys | 1972-73 - 1974-75 | 363 | Lanier-Andersen |

(continued)

Table 3 (cont)

| Source | Period | Number of Institutions | Project |
|---|---|---|---|
| Measures of Financial Conditions (AICCU) | 1973-74 - 1974-75 | 82 | CPEC (Minter) |
| Related Sources | 1960-61 - 1976-77 | Varies | HEPI |
| Special Surveys | 1964-65 & 1967-78<br>1971-72 & 1974-75 | 40 | Anderson |
| | 1966-67 - 1976-77 | 5 | Wormley |
| | 1967-68 - 1973-74 | 1,775 | Harvard |
| | 1970-71 - 1974-75 | 35 + 28 | GAO |
| | 1971-72 | 48 | Jenny (-Wynn) |
| | 1973-74 - 1974-75 | 82 | CPEC |
| | 1975-76 - 1977-78 | 55 | SCC |
| | 1976-77 - 1977-78<br>& projected 1978-79 | 187 | Minter |

further complicated such an analysis. Another difficulty was caused by problems in institutions' reporting of sources of financial aid revenues. According to Hans Jenny, while institutions reported the aid they provided to students, much aid going directly to students--such as state scholarships and federal grants and loans--was often not reported by source. His concerns became even more relevant after the changes in federal student aid programs in 1972 caused an ever greater proportion of aid to be directed to students rather than through institutions.

Financial data became available in machine-readable form from NCES in 1972. This allowed agencies to begin using these data without the expense of creating their own surveys. Several states had been using HEGIS data for their own analysis of institutional finances since 1965-66. Examples of California and New York uses are reported here.

The California Associated Independent Colleges and Universities began a study of the financial health of the independent institutions in 1974. Principal investigator John Minter conducted a review of HEGIS data, using direct correspondence with financial officers of each campus. He concluded that prevailing accounting and reporting practice differences made the data unreliable for detailed analyses. James Farmer claimed in the ACE/NCES report that this study had two major impacts on future financial reporting.[1] First, participating institutions became more aware of the availability of financial data and became trained in the analysis of data and the use of comparisons. Second, the identified differences in financial reporting practices led Minter to begin his process of analyzing audited financial statements of individual institutions.

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[1] ACE/NCES, p. 5

The California Postsecondary Education Commission's State Policy Toward Independent Postsecondary Institutions used HEGIS data for the years 1970-71 through 1976-77 to assess the financial condition of the 82 independents in California. The Commission staff also utilized three other sources of data: audited financial statements provided by the institutions, a questionnaire prepared by Commission staff, and Measures of Financial Condition, which was provided by AICCU (all described below).

The primary sources of data used in the New York Temporary Commission on the Future of Postsecondary Education study of independent institutions were institutional and sector enrollments obtained from the State Education Department's DATACORE (described below) and the HEGIS financial and enrollment data obtained from the National Education Data Library's database. Trends over the five-year period 1972-73 through 1976-77 were examined for 95 institutions. James Farmer asserted that a more extensive analysis would have been useful but that the currently available data were sufficient for the limited purposes of screening of institutions' difficulties prior to review in depth by analysts familiar with their conditions.[2]

The VPI study of demised and live "invisible" colleges used financial data drawn from HEGIS. Data for the demised institutions were from the next to or last fiscal year that the institutions existed while data for the live invisible colleges were from the 1973 fiscal year. For comparability, the data for the demised institutions were adjusted to 1973 price levels using the inflation rates from HEPI.

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[2] ACE/NCES, p.7

The authors noted that it was necessary to exclude a number of data elements because some figures reported "did not appear reasonable."[3]

ACE's 1976 study of the private sector of higher education was limited to data from 1972-73. The HEGIS financial tape, with data from 2,809 institutions, was used to develop the financial taxonomy. It was supplemented by the HEGIS residence and migration tape, which supplied data on the numbers of students in a given institution who were classified as "in-state" versus "out-of-state." Smith and Henderson commented that it was not possible to repeat the same statistical procedures with completely comparable data except for fiscal years 1971 through 1974. However, they projected that the 1974-75 introduction of new categories on the HEGIS form might provide useful new distinctions and insights into institutional finance. Particularly, they pointed to better differentiations between restricted and unrestricted funds for revenue sources.

The ACE/NCES 1978 Experimental Project on Financial Health Indicators used data from the first year of the revised HEGIS financial format, 1974-75. That year was also the most recent one for which the full set of surveys was available: finance, opening fall enrollment, institutional characteristics, faculty salaries and tenure, physical facilities, and earned degrees conferred. The ACE staff took data elements directly from the existing files. Since the project was exploratory, they did not check for accuracy beyond the editing normally done by NCES before a survey is released. A quick scan of extreme values caused the authors to caution about possible miscoding and/or faulty data entry in several institutions. However, the project was undertaken with the firm conviction that the best way to improve HEGIS data was to get them used, so that the users themselves see the value of providing better, more consistent data while at the same time parallel efforts were under way to refine the concept of financial condition and better validate indicators of financial health.

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[3] VPI, p. V.8.

Collier and Patrick's research for NCHEMS in 1978 was also based on indicators derived from HEGIS data. The rationale for this choice of data was primarily one of ease of access. After correcting minor data errors for the five-year period from fiscal year 1972 through 1976, analyses were performed and comparisons were made with the distribution of ratios provided by John Minter Associates.[4] Results of this comparison led Collier to conclude that edited HEGIS data were sufficiently accurate for most intended uses.

The ACE/NCES report provides a synthesis of the assessments of quality and currency of HEGIS data in its evaluation of past, present, and future uses. In Chapter I, the authors argued that past attempts to use HEGIS data for financial studies in which institutions were the basic unit of analysis fell short of expectations because of four reasons:

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[4] Patrick and Collier, "A Validity Check on the HEGIS Finance Data," NCHEMS, Boulder, Colorado, January 1979.

1. A lack of consensus on what constitutes a "healthy" or an "unhealthy" financial condition for a college or university.
2. A lack of clarity on the part of some institutions as to which data elements from their institutional fund accounts should be included in the HEGIS reports.
3. General agreement that financial data relative to the current operations, which are reported for a single year, do not reflect the circumstances characterizing the continuing and overall condition of the institution.
4. A lack of appropriate, analytically based institutional reference groupings to allow colleges and universities to compare themselves against similar organizations.[5]

In the chapter on the value of the current project, the authors cited several problems sometimes encountered in using HEGIS data.[6] First, HEGIS surveys do not ask for some balance sheet information that would be valuable for assessing financial risk and deferred maintenance. Second, HEGIS data are not current; consequently, institutions may prefer to use current budget data rather than audited fiscal data for making management decisions. Finally, HEGIS data are sometimes not accurate.

In recognizing these concerns, the NCES staff has pointed out the fact that they are continually urged to minimize the response burdens of their surveys. While more data might be desirable, there are practical limits on what can be collected. Furthermore, while a considerable amount of editing and checking is done on the HEGIS financial data, reporting errors by institutions are difficult to detect during the editing process. Moreover, limited time and staff resources make it difficult for NCES to track down and correct apparent errors. With regard to asserted problems in performing trend analyses with HEGIS data, the most recent 1974-75 changes in the financial reporting forms were carried out to bring the forms into correspondence with the revised AICPA/NACUBO financial standards. These changes were lauded by most analysts, and generally reflected the improvements in the newly developing field of nonprofit accounting. The authors of the ACE/NCES project concluded that, for most uses, HEGIS should yield most of the needed data from a central source on a consistent and easily accessible basis. Further improvements in the quality of the aggregated data are anticipated as the data are used and as more and more institutions begin to accept and apply the national nonprofit accounting standards.

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[5] ACE/NCES, p. 2.

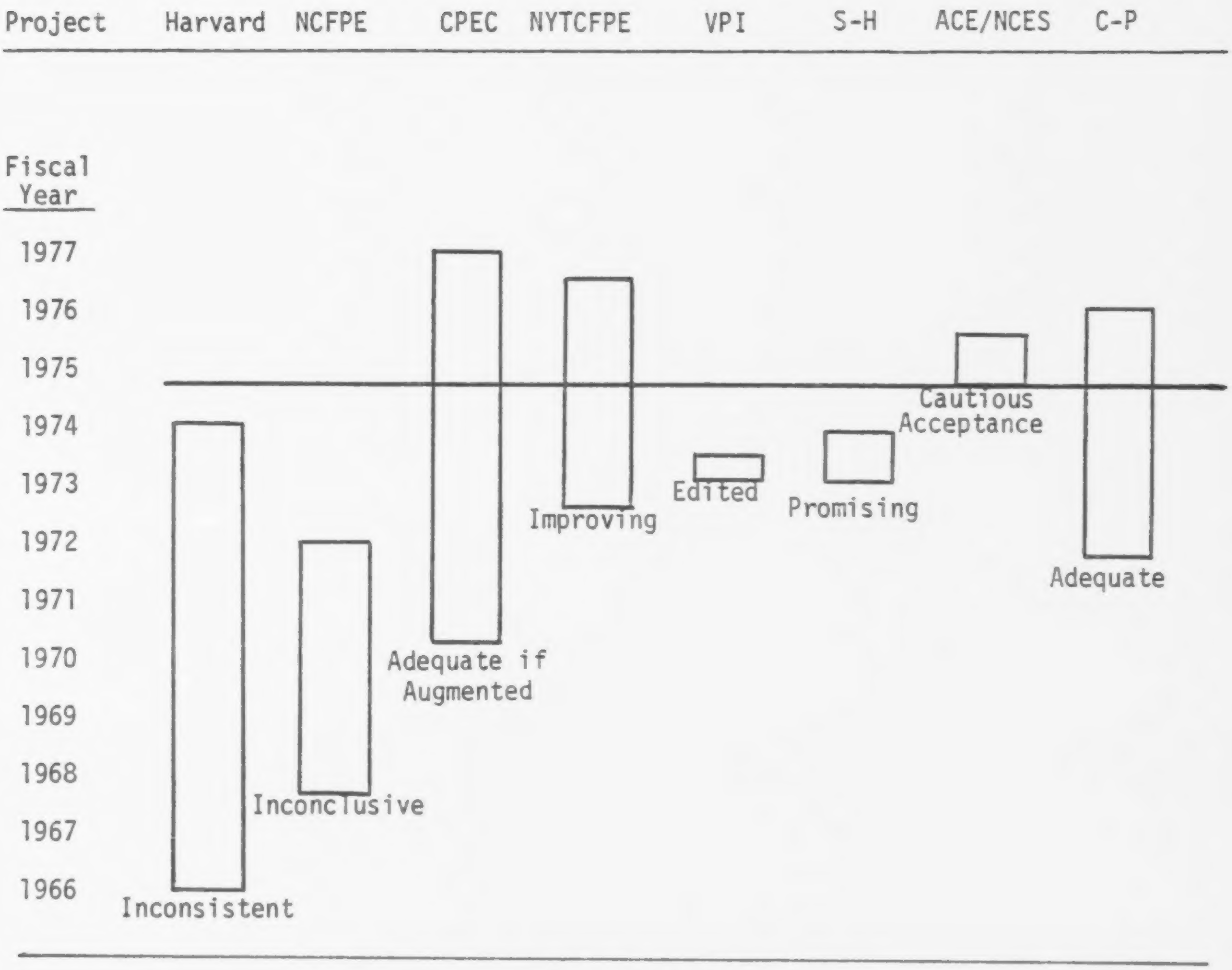
[6] Ibid., pp. 23-24

Table 4 can be used as a cursory review of selected authors' evaluations of HEGIS financial data by period of use.

The single-word ratings are either direct quotations of the authors or terms selected to convey the overall impression described above. It is most interesting to note that the ratings that denote the lesser evaluations are, for most cases, those of studies using earlier HEGIS data before the revision of the HEGIS finance survey which is marked by the line between FY 1974 and FY 1975. The two studies that used more recent data (NYTCFPE and Collier-Patrick) and that also contain an assessment of data (the CPEC study does not) seem to indicate that users are becoming increasingly more satisfied with the quality of the nationally developed database.

Table 4

Period of Use of HEGIS Financial Data and the Authors' Evaluations of Their Quality



Key: S-H = Smith-Henderson
C-P = Collier-Patrick
All others denoted above line between 1974 & 1975 signify revised HEGIS finance format.

The quest for improved data for financial analyses of colleges and universities is suggested by Table 5. It outlines a summary of the reported problems with HEGIS data and provides a preview of the temporary solutions and ramifications cited below.

Perhaps the most appreciated improvement has been the increased currency of findings released by NCES. Administrator Marie Eldridge has implemented a program of "early release of data." Early release has produced summaries of key policy data sometimes within four to five months after the survey due date.

## EDSTAT

NCES's EDSTAT, a complete database of HEGIS and other data, has been preferred by online users because the format was developed for analytical purposes. It provides a magnetic tape of one record length per institution per academic year. Although it is derived from HEGIS, EDSTAT data tapes are often available well in advance of full-scale NCES publications. At the time of this writing. for example, HEGIS finanancial data were being collected for 1978, while the latest available EDSTAT financial data file was for 1977.

The EDSTAT I database system for data from HEGIS surveys 1972 through 1974 was used by Lupton, Augenblick, and Heyison for their analysis of the financial state of higher education as reported in Change. The New Jersey staff decided to eliminate data from 1,024 institutions, 420 of which were public, for data deficiencies. The reduced population of 2,163 institutions was then considered valid for the purpose of assessing financial conditions.

## Table 5

## Summary of Author's Criticism of Quality and Currency of HEGIS Finanacial Data with Citations of Intended Improvements

| Reference | Problem | Temporary Solution |
|---|---|---|
| | -VALIDITY- | |
| Harvard<br>ACE/NCES | a) HEGIS not intended for financial indicator analyses | a) Augmented by special surveys (see below) |
| Jenny; NCPFE<br>ACE/NCES | b) Required data unavailable | b) Cash flow model (Jenny), special surveys, trend analyses (Van Alstyne et al.) |
| Harvard<br>ACE/NCES | c) Inconsistencies in institutional accounting practices | c) AICPA Guidelines (1974); increased adherence to NACUBO guidelines |
| | -RELIABILITY- | |
| Harvard; VPI<br>Collier-Patrick<br>ACE/NCES | a) Reporting errors, omissions, etc. | a) Increased usage will promote accuracy (ACE/NCES) |
| Harvard<br>Smith-Henderson | b) Change in nonprofit accounting standards: forms for FY 1971-74 vs. FY 1975-79 | b) Use of audited financial statements |
| | -CURRENCY- | |
| ACE/NCES<br>Smith-Henderson | Delay in publication | Decisionmakers use budget data and/or contract for private services (CPEC, ICUP); advance publication of preliminary national estimates |

## DATACORE

Designed by the state of New York, DATACORE information is based on HEGIS with supplementary questions. Like EDSTAT, this machine-readable database can be accessed through keyboard terminals.

New York's Commission on Independent Colleges and Universities (cIcu) use of DATACORE for its 1976 Master Plan preceded the NYTCFPE study described above. The Master Plan displayed ratios from 109 institutions for FY1974 and FY1975 while the NYTCFPE's study of 95 independent institutions in 1977 illustrated trends for the five-year period 1973 through 1977. Neither report included an evaluation of the data.

The Higher Education Data System (HEDS) is maintained by the New York State Department of Education. Like DATACORE, HEDS is based in large part on the HEGIS system. Basic data (150 key items) on 1,945 independent institutions have been stored by the state. The NYS Monitor project extracts HEDS items and those from several supplementary sources, primarily audit reports. Since the purpose of the project is to eventually make policy decisions regarding the independent institutions, accuracy and timeliness are central to the project staff. Paul Wing reported to the Second Annual Conference on Measuring Financial Conditions of Colleges and Universities that the data were sufficient for their screening purposes.

## Audited Financial Statements Provided by Institutions

Over the past five years Bowen and Minter have provided a major service to data users by cross-checking audited financial statements and supplementary financial reports to produce more reliable and timely data.

For their annual reports on the condition of the private sector, Bowen and Minter asked institutions (100 in 1975 and 135 in 1978) to submit copies of their HEGIS reports, salary information as reported to AAUP, audited financial statements, and supporting schedules and voluntary support surveys. Through a gradually refined process of tabulation, comparison, and analysis of these documents, they have produced a substantially revised database of a stratified sample of independent colleges and universities.

Under the provisions of the New York education law governing the administration of "Bundy aid" funds, recipient institutions are required to report annually on the financial condition of the institution. The report on the financial condition of New York State Colleges and Universities (NYSCU) is based upon the audited financial reports submitted by each recipient institution as required by law. Statements from FY1970 through FY1973 were examined for the March 1974 report--a lag time of less than a year. The report documented certain modifications of the reported data which were required since reporting formats varied (the approach used was the fund accounting model described in College and University Business Administration, 1968 edition).

Usage of financial statements was not described in detail in the New York Regents Advisory Commission (NYRAC) report. Likewise, Lanier and Andersen's description of the use of financial statements for the single fiscal year 1973 was overshadowed by their sample survey procedure outlined below in "Higher Education Panel."

Wormley's in-depth analysis of five California independents used financial statements for 11 fiscal years (1967 to 1977) as the primary source of objective information. Supplementary data were used to explain the changes indicated by the statements. Wormley reflected that the supplementary information provided the necessary insight into the specific set of circumstances operating at each of the five schools but that the task could not have been done without the audited financial statements.

Anderson requested audited financial statements from the 40 single-sex and religious colleges for the fiscal years 1965, 1968, 1972, and 1975. When statements were not available for the requested years, adjacent year substitutions were made or linear interpolation was used to fill in the data gap. Since the study covered an 11 year period, his research relied heavily on HEPI and the price indices developed for liberal arts colleges by Wynn. Anderson's consolidation of the balance sheets is described in the chapter on methodology for constructing indicators.

Recommendation seven for California's State Policy Toward Independent Postsecondary Institutions, if accepted, may improve data availability and establish precedents for other governments. It suggested that CPEC should request annually an audited financial statement from each independent institution receiving financial aid through state student assistance programs. The report would be used to prepare the annual report to the legislature concerning the financial health of the independent sector.

John Minter Associates financial position and progress reports for the Independent Colleges and Universities of Pennsylvania (ICUP), and Minnesota (ICUM) rely entirely upon audited financial statements. JMA interprets these statements according to the current balance fund and sheet codes that have been standardized by NCHEMS and the National Association of College and University Business Officers (NACUBO). In addition, JMA made audit changes in 1978 retroactive to 1974 in their database for two types of transactions. They distributed fringe benefits to the appropriate expenditure category for all institutions; this frequently resulted in decreased "institutional support" costs and increased "instruction" and other heavy "personnel use" costs. Current asset and liability measures were improved by identifying non-liquid items such as prepaid expenses and deferred revenues and removing them from current liquidity tests.[7] These steps were taken in response to recommendations from a seminar conducted in 1977 by the Pennsylvania Commission of Independent Colleges and Universities.

## Fiscal-Operations and Applications

The fiscal-operations (FISCOPs) reports were a set of annual reports required of each institution receiving federal student financial aid. Until they were combined in July 1978, FISCOPs were separate from the institution's fiscal application (FISCAPs) for financial assistance from USOE for the following year. Now, the additional forms provide financial data that can supplement other, less detailed financial aid databases. As mentioned above, the Harvard Title III evaluation used FISCOPs and FISCAPs from fiscal years 1972 through 1974. There was, however, no evaluation of their utility.

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[7] John Minter Associates, p. 2.

## Title III Applications

The applications for HEA Title III funds include both enrollment and financial data. The Harvard team used data for fiscal years 1970 through 1973 from Title III applications filed in fiscal years 1971 through 1974, respectively. A comparison between HEGIS and Title III data using 36 variables served to verify the quality of Title III data. All of the corresponding means calculated from the two data sources differed somewhat, but differences were much less than one standard deviation. The entire analysis demonstrated for their purposes the compatibility and accuracy of the Title III and HEGIS databases.

## Higher Education Panel

The American Council on Education's Higher Education Panel (HEP) was created to obtain relatively rapid responses to crucial issues in postsecondary education. The usual turn-around time from questionnaire conception to published results has been about six months. This degree of speed is possible since the source of information is a stratified sample of institutions that participate willingly. The sample of 646 institutions participating in 1975 was chosen to be approximately representative of the population of institutions of higher education by control and level and by the classification established by NCES for its HEGIS reports. However, since the HEP plan was originally designed more for NIH use than for any other agency, institutions with medical schools are 100 percent represented, while two-year schools and small private schools are underrepresented.

Lanier and Andersen employed the HEP survey not only to reduce the time lag that HEGIS would have required but also to gain timely insight into how different kinds of institutions planned to meet the worsening economic conditions that were anticipated for the coming year. The questions used closely resembled HEGIS items. They were arranged to provide financial and enrollment data for three fiscal years: 1973, 1974, and 1975. Audited financial statements augmented FY 1973 data.

## Measures of Financial Conditions

The California Postsecondary Education Commission supplemented HEGIS data with the Association of Independent California Colleges and Universities' Measures of Financial Condition, which provided analysis of the financial statements from 68 independent institutions for fiscal years 1974 and 1975. The CPEC author noted that the detailed analysis of financial statements to be provided annually by John Minter Associates can be expected to provide a "reliable indicator" of the financial health of the institutions.[8] The 1978 conclusions, meanwhile, were considered "tentative and preliminary in nature" since they were based upon only two years of current fund analysis. Annually updated trend analysis was identified as the means to greater certainty.

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[8] California Postsecondary Education Commission, p. 90.

## Related Sources and Special Surveys

Studies performed for highly specialized purposes and/or unique principal users often required data unavailable from HEGIS or the other data sources listed above. In such cases, either special surveys peculiar to the single study were constructed or financial data from other agencies were collected. The GAO investigation of the causes of change and problems of small private liberal arts colleges is an example of a one-time study. The development of *Higher Education Prices and Price Indexes* required data from the Boeckh Division of the American Appraisal Company, the Bureau of Economic Analysis, the Bureau of Labor Statistics, and the National Science Foundation, as well as from NCES and postsecondary institutions themselves. Eight other sources are briefly described below for users who may have similar needs of precision and/or particularity.

*Related sources*. As stated earlier, Halstead's *Higher Education Prices and Price Indexes* describes the development of five price indexes: the higher education price index (HEPI), the research and development price index (R&DPI), the physical plant price indexes, the student tuition price index (TPI), and room and board charges. The prime data sources for HEPI were expenditure records of the University of Wisconsin System and the Oklahoma State Regents for Higher Education. The breakdown of expenditures for professional salaries by occupational categories was based on information obtained from the 1970-71 HEGIS. Nonprofessional salaries by occupation were computed using an employee count conducted in 1971 by the Office of Institutional Research, State University of New York.

decreases (lower tuition fee charges at public schools, inadequate student aid, etc.), causes of current financial condition (inflation, increase in number of students requiring financial aid, etc.), and the impact of federal regulations (the entitlements, NSF and the Fund for Improvement of Postsecondary Education) on the institution. Ninety percent (282) of the schools responded.

Jenny and Wynn constructed their own "institutional cost of living index" from data obtained from private four-year institutions. While Jenny claimed to his audience in 1974 that the available data were too old and not responsive to the proper questions, Halstead praised the excellence of Jenny and Wynn's interpretive studies for this sector.[9] Anderson used this more specialized set of indices which Wynn developed.[10]

Approximately 30 percent of the independent California institutions responded to a lengthy questionnaire prepared by the CPEC staff. This questionnaire was the primary source for data concerning students, faculty, and administrative and non-academic staff. The optimistic self-assessment of the chief executive officers who reported was nearly identical to that received by Bowen and Minter in their national study.

The survey designed for the Small College Consortium evaluation requested entries easily attainable from HEGIS and balance sheets. Income and expenditure data were analyzed for the base year and the two years subsequent to SCC technical assistance implementation. Upon publication of the results, a few schools revised their reports.

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[9] Halstead, p. 35.

[10] Anderson, p. 18.

The data for Minter's Change article were produced via telephone interviews with 187 chief financial officers during December 11 through 20, 1978. Minter used a methodology similar to an application used throughout business and industry. The consensus technique, noting the difference between the percentage of firms reporting higher and lower on key business indicators, has been used widely in that sector since its implementation in 1931 by the National Purchasing Management Association. Minter's questions were designed to gain information that the financial officers would know without researching records. Data were displayed in the article as the percentage reporting "lower than prior year," etc., and as bar graphs. Consensus ranges of 0 to 29 percentage points were considered to indicate a weak trend, 30 to 59 for moderate, and 60 to 100 points for strong trends.

## Data in the Future

Data to be used in future analyses will only be as valuable as the financial theory on which they are based. Jenny has proclaimed that broad aggregations of data will continue to be but statistical pyrotechnics until analysts can determine what is really going on within the institutions.[11] Similarly, Van Alstyne has held that recent data analyses have not corresponded to the key policy issues facing higher education decisionmakers.

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[11] Remarks from address by Hans Jenny, "Improving the Conceptual Framework for Measuring Financial Conditions," ACE/NCES conference.

The R&DPI is composed of personnel compensation and contracted services, supplies, and equipment. Professional and nonprofessional salaries were derived from the National Science Foundation biennial surveys of universities and colleges covering R&D funding for academic years 1965-66 through 1972-73. Research expenditure data not reported in NSF surveys were obtained from the University of Wisconsin System. For both HEPI and R&DPI, supplementary data were culled from the National Survey of Professional, Administrative, Technical and Clerical Pay conducted by the U.S. Bureau of Labor Statistics.

Physical plant price indexes were drawn almost exclusively from the Boeckh index of apartments, hotels, and office buildings compiled by the Boeckh Division of the American Appraisal Company, Inc., which is reported in Construction Review, published monthly by the U.S. Department of Commerce. Halstead claimed that the Boeckh index is statistically adequate and consistent and does not exhibit deficiencies that characterize many indexes compiled by private organizations.

Many sources are available for constructing a TPI. The Education Directory, published by NCES, lists tuition and fees, as does the College Scholarship Service of the College Entrance Examination Board and the Life Insurance Marketing and Research Association of Hartford, which annually publishes College Costs. Halstead chose to use College Facts Chart published by the National Beta Club. Beta Club data were selected because the organization's publication had consistently reported data for the time period required and its reporting was timely. Room and board charges were also prepared using Beta Club data and cross-checking against the other sources.

Special surveys. For their applied research investigations of the causes of financial change in small private colleges, both Anderson and Wormley interviewed key administrators and solicited feedback via questionnaires. Anderson asked questions such as, "What were the internal and external forces of change?" and "What were the anticipated and unanticipated effects of these changes?" Wormley focused more on providing the context for interpreting the financial statements and on explanations for changes offered by the change-agents themselves.

The Council for Financial Aid to Education (CFAE) survey of private giving was considered by the Harvard evaluators because it describes contributions by colleges by source and purpose. The survey appears not to have the limitations caused by vague definitions. The Harvard team found little consistency, however, between the CFAE data and information reported to other sources. They hypothesized that the discrepancies were caused by different accounting principles and completion of the form by development officers rather than by financial officers.

The General Accounting Office used data from a variety of sources: Minter and Bowen's Annual Report series, NCES's Projections of Education Statistics to 1985-86, and field interviews. To identify the types and effectiveness of smaller institutions' internal efforts to resolve problems, GAO created its own "Survey of the Financial Condition of Small Colleges." From 332 institutions that were not current on HUD and HEW loans as of September 1975, they requested detailed information on the facility construction loans provided by HUD and HEW (series of loan, status of sinking fund, etc.) on the extent of causes of enrollment

Meanwhile, the mechanics of data preparation have improved. Recent users of HEGIS data have noted that validation procedures confirm the usability of surveys since fiscal year 1975. Collier and Patrick found a statistical compatibility between aggregated HEGIS and John Minter Associates data in their 1978 study. Farmer also reported that the data have improved in reliability. Further, he speculates that with increase in usage, reliability will increase.[12] The rationale is that with increased use of the results, reporters will become more responsible and reporting accuracy will complement the improvements in financial accounting and communications. In time, enough data will accrue to allow for trend analyses that span an entire economic cycle (see Van Alstyne in Chapter V).

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[12] Remarks from "Statement of Purpose" address at ACE/NCES conference.

# Chapter IV

# METHODOLOGIES FOR FINANCIAL INDICATOR SELECTION

An explanation for the differences between selected indicators for financial analyses of colleges and universities for the years 1973 through 1978 has been presented in Chapters II and III. The basic premise has been that a variety of purposes and/or needs of principal users has resulted in a plethora of financial indicators and frameworks from which to view financial positions and trends. Three factors involved in project designs seem to have accounted for this variety: time, cost, and reliability. Given these constraints and the (lack of) availability of data, the project director usually has had limited flexibility in choosing the methodology for selecting the indicators and has had even less control over the eventual validation of these tools of analysis. A review of selection methodologies is presented here; validation techniques are described separately in the next chapter.

One-half of the 40 studies actually contain statements of the methodology used for selection or construction of their indicators. Although very few of these studies attempted specifically to replicate earlier work, there appear to be only two fundamentally different types of approaches to selection: Theoretical and empirical.

Studies with theoretical methodologies have evolved a priori conceptual models and then selected indicators to fit the resulting framework. Testimony from experienced individuals or groups has frequently been used to augment theories in selecting working indicators. Literature reviews of previous work have also been used in conjunction with theoretical approaches. The SCC evaluation is an example of a project that relied upon indicators selected by predecessors. On the other hand, higher than average resources may mean that developmental work may be pursued using theoretical and empirical methods. The two-year, $160,000, NIE-sponsored indicators project directed by Collier and Patrick has benefited from guidance by a board of directors and other consultants, the theoretical refinement of a six-part framework, and the use of both univariate and multivariate analysis approaches for empirical support of their judgments.

Table 6 displays the organization of the two types of methodologies for selecting indicators by the specific process used for each project. Since most of the results or sets of indicators were listed or described in context of the chapter on purposes, only the methodologies are described below.

## Theoretical Approaches

Description of institutional status. Carroll's initial attempt in 1973 to translate the financial analysis model of businesses to that of colleges and universities is described in a four-step approach. First, she reasoned to determine those basic factors that affected financial health. Second, she identified indicators that might serve as measures of the factors hypothesized in the first step. The third step involved the suggestion of a method for analyzing each of the indicators separately. For example, to determine the relative position of product demand, indicators of enrollment were analyzed using criteria of "comprehensive" and "meaningful." Finally, Carroll suggested possible

## Table 6

## Methodologies for Financial Indicators Selection by Project

| Type | Process | Project |
|---|---|---|
| Theoretical | Description of Status | Carroll<br>Collier 73 |
| | Description of Trends | Collier-Patrick<br>Minter-Bowen<br>CPEC<br>Anderson<br>Minter |
| | Expert Testimony | NCFPE<br>*Change*<br>Collier 76<br>VPI<br>NYTCFPE<br>ACE/NCES |
| | Review of Previous Work | Harvard<br>Lanier-Andersen<br>Truitt<br>Wormley<br>SCC |
| Statistical | Principal Component Analysis | Smith-Henderson |
| | Discriminant Analysis | *Change*<br>Collier-Patrick |

methods for using business comparative (key indicators compared to industry standards) and trend analyses.

Collier's (1973) approach for the determination of institutional financial duress was also based on Carroll's conceptual model. Analysis by sector, primary and secondary indicators, and determination of improvement or deterioration were the three elements of his approach. The rationale for the first step was that indicators for a single institution should be compared to indicators for other institutions within the appropriate sector (this was the position taken later in the global approach of the ACE/NCES study). Primary indicators were then defined for each of the major areas of analysis of the Carroll paper (see previous description in Chapter II). Collier selected both primary and secondary indicators based on the hypothesis that ratios could discern the differences between financially strong and distressed institutions.

Description of trends. The most recent work of Collier and Patrick (1978) has involved an elaboration of the same basic approach. A framework was developed which was intended to reflect the various dimensions of an institution's financial condition. This was accomplished by the NCHEMS staff with additional expertise provided by a business officer from a major private university, the president of a community college, and a representative of one of the major accrediting associations. Then the staff identified appropriate indicators based on in-depth consideration of the meaning of each of the six dimensions and the availability of HEGIS data. For most dimensions, indicators were developed so as to measure change over time.

Bowen and Minter have selected indicators based on the availability of data and the probability that the indicator will reflect changes over time in the condition of the private sector. Consequently, their indicators of enrollment, faculty and staff program, current fund, net worth, etc., were all chosen to answer the basic question: "In what ways are the private colleges and universities gaining ground, holding their own, or losing ground?"[1]

The California Postsecondary Education Commission's study of the financial health of California independents, designed by Minter, applied the same methodology of Bowen and Minter. Due to the CPEC's theory of control, focus was directed towards five types of indicators: (1) the ability to attract and retain students; (2) the ability to attract and retain faculty; (3) ability to sustain a workable operating budget; (4) ability to sustain long-range financial stability; and (5) ability to maintain and improve the quality of the educational program.

Anderson's financial/operating analysis of policy changes at private colleges employed a conceptual model incorporating improvements to the funds accounting method. These procedures allowed for tests of liquidity, equity and operations similar to those of business. He aggregated balance sheet information, excluded agency funds and inter-fund borrowing, and subdivided assets and liabilities into conventional categories (liquid, fixed and other assets plus short-term, long-term and other debt). Further, to establish comparability, Anderson divided by units of output--approximately by the number of FTE students. This theoretical departure from many of his colleagues yielded such unique indicators as equity per student and maintenance expenditures per plant.

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[1] Bowen and Minter, p. 5.

Minter's trend consensus approach for assessing sector viability also used a theoretical method for the selection of indicators. He noted that survey items were selected as being valid measures of trends in the three basic components of the higher education enterprise: staff, students, and money. From that framework, Minter chose indicators which "most business officers can be expected to know without further reference, thus making their response easy and brief."[2]

Expert testimony. In some studies, indicators were chosen based primarily on the experience of knowledgeable experts. For example, eight distinguished scholars and financial management experts were provided with data on 224 variables for 55 institutions and asked to rank the institutions on a five-point scale of health. Data from the 13 institutions categorized as "healthy" and the six categorized as "unhealthy" at the same level were then used in a discriminant analysis, described later.

Collier's (1976) Indicators of Institutional Financial Health is an expansion of an approach developed by business officers representing private institutions that were actually experiencing financial difficulties. The participants were separated into small working groups, and each group was given the task of developing a way of describing and analyzing an institution's financial health. The primary focus of the analysis being indicators rather than upon a comprehensive analysis of all possible causes, four indicator categories were identified.

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[2] Minter, p. 25.

The first category, ability to attract and retain students, resembles another category of indicators selected by the theoretical approach (see Minter and Bowen and CPEC above). The second, aspects of operations that would indicate past and potential financial problems, has been the goal or criterion used by almost all of the cited analysts. The other two parts of the structure--the institution's ability to deal with financial difficulties should they arise and factors that should be monitored in the event actions must be taken to deal with financial problems--reflect more of the unique value of a business officer's subjective experience.

In the beginning of the VPI study, more than 50 operating ratios were calculated. The panel of experts who advised on the project played a significant role in the selection of the final 16 ratios. The panel was composed of individuals extremely knowledgeable about the operation of liberal arts colleges.

The New York Temporary Commission on the Future of Postsecondary Education selected indicators for its study of independent colleges in New York, primarily on the basis of expertise of Commission members. The "Wessell Commission" reviewed indicators for which data were available and results would be useful and theoretically acceptable. From the pool of possible ratios, report author James Farmer made the final selection.

From the approximately 360 indicators used prior to the summer of 1977, ACE staff members selected the ratios that were used in the ACE/NCES experimental project. All ratios that were used in the Change article and that could be computed from a single academic year's data were also included. The 61 ratios finally selected were, according to ACE economist Sharon Coldren, "a potpourri--the result of several people submitting their best ideas from a variety of analytical viewpoints."[3] While redundancy was decreased, little effort was extended to challenge the validity or worth of the proposed ratios.

Review of previous work. While most studies that utilize indicators from previous works do so because of lack of resources and/or the general acceptance of the approach, the USOE-supported Harvard team attempted to identify an integrated financial model of a developing institution through an exhaustive review of previous studies and data sources. They reviewed existing theories of institutional development that might be relevant to colleges and universities and drew upon previous studies of the Title III Developing Institutions Program and upon the general literature in organizational development. In addition, they depended upon the program's own eligibility criteria. Only a small subset of the indicators they felt were appropriate to the study of institutional development were eventually found to be available in national databases.

Although similarly limited by availability of data, Lanier and Andersen restricted their search for indicators. They planned to update and extend the analysis of financial distress among colleges and universities reported by the National Commission. They used the six types of statistical evidence considered by the NCFPE, but rearranged the analysis of trends in operating revenues because of data availability and analytical enhancements. For example, Lanier and Andersen used the relationship between current-funds revenues and expenditures as the basis for determining operating surpluses/deficits rather than the corresponding relationship for E&G funds used by the NCFPE. They reasoned that institutions vary in the extent to which "interactions" between the various funds are allowed to occur, as well as in the convictions used in deciding and reporting how total current income is allocated among certain funds.[4]

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[3] ACE/NCES, p. 13.

Truitt advanced neither a final set of indicators nor a theory of financial health. Rather, he offered a theoretical process for testing the effectiveness of financial measures. His argument was that, rather than de-select, it is preferable to create a system for classifying all desirable indicators. He started with an incomplete set of measures gathered from various sources and then inductively worked towards his nine-part classification framework. He included ratios used in previous studies by Cheit, Carroll, Collier, Jellema, Balderston, and the Carnegie Commission. In addition to conventional factors such as current ratio and other business-type indicators, Truitt gathered suggestions from the staff of the NCFPE, the Research Office of the New Jersey Department of Higher Education, and a committee of institutional representatives.

Wormley benefited from the Financial Measures Project of ACE/NCES. In 1976, Van Alystyne and Coldren compiled a catalog of currently used and proposed financial indicators for systematic assessment by a Task Force of 16 higher education institutions and staff from both ACE and NACUBO. The compendium of 364 indicators was intended to be as complete and exhaustive a listing as possible (all of the sources used for the ACE/NCES project have been reviewed here). Wormley selected three types of indicators from that list using "experience" as the main criterion. Wormley cited the experience reported by Bowen-Minter and Smith-Henderson.

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[4] Lanier and Andersen, p. 32.

The set of indicators selected from the Small College Consortium was also influenced by the ACE/NCES compendium. Because the study concerned the development of independent, small colleges, the indicators used in the NYTCFPE and VPI study were also reviewed. The final selection of six indicators was then a matter of data availability and theoretical appropriateness of reviewed measures.

## Empirical Approaches

Whereas most indicator selection frameworks have been a priori classification schemes constructed rationally, Smith and Henderson sought an empirical taxonomy. Beginning with the abundance of available institutional statistical profiles, they used principal component analysis to reduce a large set of financial indices to a smaller set of measures. Principal component analysis is a type of factor analysis in which data are reduced by constructing a new set of variables on the basis of interrelations exhibited in the original set of variables. The new variables can then be defined as exact mathematical transformations of the original data.[5]

They began with 53 indicators and then selected the first seven transformed factors. The seven factors accounted for 58 percent of the variance encountered while differentiating institutions with the empirical taxonomy. The statistically-derived factors were called sponsored research variables, tuition revenue per E&G revenue, total student aid as a proportion of total current fund revenues, revenues and expenditures for E&G purposes, endowment income, income from private gifts and expenditures for libraries, and state appropriations and expenditures for administration.

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[5] Nie et al., p. 470.

Table 6 shows that discriminant analysis was the other statistical technique used to define or construct financial indicators. Discriminant analysis is similar to principal component analysis in that the goal of both is to use the indicators to distinguish explanatory characteristics of a complex (multivariable) population. The difference is that, where factor analysis reduces the number of variables to sets of common factors, discriminant analysis merely selects and weights single variables which best account for the differences between two groups. In addition, classification functions can be estimated that will assign institutions not previously grouped into the derived groups (see Collier and Patrick in "Statistical Validation Techniques").

Lupton, Augenblick, and Heyison consulted with a panel of experts to distinguish between "health" and "unhealthy" institutions. They then used discriminant analysis to identify variables that differentiated between the groups. From the available 1972-74 HEGIS data, 224 "discriminating variables" were constructed. When ratios and trends obtained from less reliable data were eliminated, 63 variables remained, from which the discriminant analysis procedure of Statistical Package for the Social Sciences (SPSS) then "selected" ten ratios, four trends, and two dummy descriptions (16 indicators) as "disciminants." This procedure was strongly criticized by Van Alstyne and others because of the very low number of institutions used to derive the discriminant function (55)--a number lower than the number of variables used. Since this analysis also included elements of indicator validation, these critiques are discussed at greater length in the next chapter.

## Chapter V

## FINANCIAL INDICATOR VALIDATION TECHNIQUES

It would have been ironic if techniques for validating indicators of the financial health of colleges and universities had appeared in "Chapter XI," because many critics have argued that the only true way to validate financial indicators is to wait until the institution has closed its doors. The seven projects that have reported some efforts to validate their indicators have all been published since 1976, which alone suggests that this infant science may still be on the threshold of technical sophistication.

The review of these techniques may be organized according to two schemas: the kind of criterion used and the statistical techniques applied. The alternatives are displayed in Table 7, although some projects used a combination of both techniques.

### Criteria of Validation

Two types of validation criteria have been used: retroactive and proactive. Procedures using these two types allow the research to either look backwards to match past events with financial measures (retroactively) or use measures to suggest what may take place in the future if the current trends persist (proactively). The VPI study exemplifies an attempt at retroactive validation, since the authors used demised and live invisible colleges as the starting point and then determined how accurately their indicators supported the known events. Proactive validation is much more difficult and consequential. Some

Table 7

Financial Indicators Validation Techniques by Project

| Type of Classification | Process | Project |
|---|---|---|
| By Criteria Used: | | |
| Retroactive | Live vs. demised | VPI |
| | Administrators' recollection | Anderson |
| Proactive | Closings | NYTCFPE |
| | Case Studies | NYS Monitor |
| By Type of Analysis: | | |
| | Disciminant analysis | Change |
| | Cluster and discriminant analysis | VPI |
| | Production function analysis | Harvard |
| | Discriminant analysis with conceptual framework | Collier-Patrick |

argue that the prediction of distress might actually lead to distress. The New York State Monitor project uses six indicators to project difficulties and then pursues identified potential problems with case studies to confirm financial conditions before recommending appropriate action.

Retroactive validation. The actual mechanics of validation used by the VPI study reflect the retroactive method--start with known effects and manipulate the indicators until the effects can be optimally predicted. Researchers Anderson, McBee, and Beekin found that although clear evidence existed that 59 institutions closed or merged, their selected indicators did not accurately discern financial differences among them. Consequently, they could only recommend other statistical probes; Andrew and Friedman had to use more qualitative information to account for the demise of small private liberal arts colleges.

Richard Anderson used another method to validate the financial indicators he developed to assess strategic policy changes at private colleges. He questioned chief business officers, not so much for their expertise but for data verification and recollection of the events associated with the data. With minor exceptions, the indicators did seem to highlight the ten-year fiscal trends. This procedure allowed for the discovery of actual accounting changes and reliable reconcilation of data. Anderson concluded that, in most cases, the business officers "felt the measures were accurate and revealing."[1]

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[1] Anderson, p. 22.

Proactive validation. The NYTCFPE report does not delineate the results of its validation process. The final sentence of the section on financial indicators does, however, dictate the strategy that would have been used if there had been time to wait: "Only subsequent events can determine how valid the indicators will be."[2] Farmer's use of five financial indicators plus enrollment yielded a list of institutions with multiple distress signals. Five colleges were cited as having two or more indicators of financial distress plus enrollment declines. Subsequent events (1977-78) not cited in the study have resulted in the closing of three of those colleges, the merging of one, and reorganization of the other institutions.

The New York State Education Department monitors the financial condition of independent institutions with a preliminary assessment using six indicators. In each of the 20 institutions that have shown distress, case studies have followed. Eight institutions have been found to be in serious financial trouble. Each of these troubled institutions are expected to review the case study with state officials and determine how the institution will address its problems. This procedure is not an attempt to validate financial indicators. State officials have been extremely careful not to initiate a self-fulfilling prophecy of demise. At any rate, the eventual byproduct of this operation may be indicators that can differentiate early warnings of distress from false signs of statistical analysis.

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[2] Farmer, p. 38.

## Type of Statistical Analysis Procedures

In the preceding chapter, discriminant analysis was described as the methodology used by Lupton, Augenblick, and Heyison to select the 16 indicators for the Change article. That analysis represented one of four distinct statistical methods used to validate indicators. When the Z-scores for their variables were weighted by the computer program and aggregated, a discriminant score was produced. According to the Wilks' lambda criterion, the weighted scale contained over 97 percent of the discriminating information present in the sample of 55 institutions. The program then calculated scores for all 2,163 institutions for which sufficient HEGIS data were available.

The technical notes of the authors claimed that although the actual weighting factors used by the panel could not be discerned by the analysis, this validation technique demonstrated that differences in variables with appropriate weightings can "mimic" the ratings of the panel.[3] They concluded that despite the risks involved, the technique of combining objective analytical principles with a consensus of subjective expertise marked a significant step in gaining better understanding of the relative fiscal conditions of academic institutions.[4]

Although the authors and publisher of Change reported a validation process for the indicators and their results, Carol Van Alstyne, chief economist for ACE and one of the eight experts consulted for the Change article, reported that their conclusions went "too far, too fast."[5]

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[3] Change, p. 36.

[4] Ibid.

[5] Van Alstyne, p. 2.

In her memorandum to ACE Vice President Stephen Bailey, she cited ten objections to the published conclusions. Van Alstyne, with the assistance of statistician A. Jackson Stenner, President of NTS Research Corporation, and Paula Knepper of ACE, pointed out four faults with the validation procedures: (1) generalizing trends from a snapshop analysis, (2) not cross-validating the small sample of institutions, (3) using a narrow database, and (4) general underdevelopment of the discriminant analysis.[6]

First, the authors implied "worsened" conditions in higher education when their discriminant analysis data were applied to a single fiscal year. Van Alstyne, a long-time proponent of trend analysis, recommended that any future trend analyses select a period that corresponds to at least one full economic cycle or else modify the interpretation of the data in consideration of the concurrent direction of the general economy.

Second, the researchers utilized a sample of 55 institutions in conducting their analysis. In a situation where there are more predictor variables (in this case, 64) than cases, an almost "perfect" discriminant function is virtually guaranteed. However, it is likely to have virtually no stability upon cross-validation. Standard procedure in discriminant analysis with samples under 200 cases is always to draw a second sample for cross-validation with the first. This was not done.

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[6] For excellent commentaries by A. Jackson Stenner, "Applications of Statistics to Financial Indicator Development," and "Comments on Methodological and Statistical Problems Present in Financial Measures Analyses," see ACE's New Developments in Measuring Financial Conditions of Colleges and Universities, pp. 54-59, and pp. 77-81, respectively.

Third, the use of data from 55 institutions was used to make generalizations about 2,163 institutions. This practice was considered an extremely narrow base for making such broad statements about the financial health of the nation's postsecondary institutions.

The VPI authors applied both univariate and multivariate statistics in order to assess the indicators they used to describe live and demised colleges. Univariate F-tests, stepwise discriminant analysis, and cluster analysis were completed using 16 operating ratios as independent variables. Using an adjusted alpha level for the F-tests because the independent variables and the indicators were interrelated, live and demised colleges were found to differ significantly on six indicators: current fund expenditures per current fund revenue, E&G expenditures per E&G revenue, house and food expenditures per house and food revenue, E&G tuition revenue per FTE students, E&G total expenditures per FTE students, and plant maintenance E&G expenditures per total current fund expenditures.

The SPSS version of stepwise discriminant analysis was performed using all 16 ratios as variables for the 485 live and 59 demised invisible colleges. The discriminant function accounted for only 18.9 percent of the variance. Thus, the authors implied that the 16 ratios selected primarily by the advisors were not the only discriminators that could have been used.

The Baker cluster analysis was also run as a cross-check to the multivariate discriminant analysis. The results from the cluster analysis indicated that the demised and live colleges did not constitute two well-defined groups. Ten live colleges showed potential financial difficulty and eighteen demised colleges did not have much similarity with more than one other demised college. This heterogeneity between the two groups led the researchers to suggest that other factors such as type of institutional control, size of enrollment, breadth of academic offerings, diversity of mission, and effectiveness and efficiency of the institutional management team should be incorporated in the predictive model in order to define more adequately the subgroupings.[7]

If the assumption can be made that relatively efficient colleges are financially healthy institutions, then the "efficient function" analysis of the Harvard team may be considered another statistical approach used to validate indicators. For the Title III evaluation, Trueheart and Weathersby used empirical estimations of the "resource use behavior" of relatively efficient, historically black, four-year colleges and showed that, for the variables considered, there were significant economies achievable by adopting the resource use patterns of relatively efficient institutions.

Their technique was based on the view of the college or university as an organization with many and often conflicting objectives, seeking to acquire and use resources in the most productive manner. Using a theory of the firm that assumed the existence of a production function, the researchers used three functional forms to describe the transformation of inputs (educational resources) into outputs (services provided) along production curves: a linear model, the Cobb-Douglas, and the Constant Elasticity of Substitution (CES). Estimation procedures produced the data points from which the identification of the convex hull of extreme points, or "efficient surfaces," was performed for different types of analysis.

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[7] VPI, p. V.17.

By developing such continuous functions through the subsets of data points on efficient surfaces, Trueheart and Weathersby concluded that while public four-year black colleges exhibited greater returns to scale than did the private four-year black colleges, neither group exhibited statistically significant economies of scale (e.g., for enrollments between 456 and 5,678, and faculty between 43 and 295, once an institution is on the efficient surface there are not demonstrable economies of growth).[8]

Like their predecessors, Collier and Patrick used discriminant analysis to test their indicators. Their intention was to use an eight-step procedure that would overcome the weakness of the technique reported in *Change*.

First, they calculated each indicator separately for 24 public four-year and 47 private four-year institutions. Then they calculated summary descriptive statistics for each indicator by institutional type. The third step required correcting data errors in order to recalculate the descriptive statistics. Next, experts were consulted to select institutions in a decidedly strong or weak financial condition. (Unlike the *Change* article, these experts were persons who had a working knowledge of the financial operations of the institutions they rated.) Fifth, profiles of all indicators for each public and private institution were examined. At that stage, Patrick intercorrelated indicators separately by type to investigate the degree of relationship among the selected indicators (this was done to assess the extent to which the fund accounting data were circular). The seventh step involved the labeling of strong and weak institutions for use as dependent variables in the multivariate discriminant analysis. The final step was the refinement of the discriminant analysis results by the addition or deletion of indicators to find the best discriminating equation using 1975-76 data.

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[8] Harvard, Appendix G, p. 21.

Five variables were found to account for 40 percent of the variability in group membership. The five ratios were interest ratio, unrestricted funds ratio, average increase to fund balances, the dispersion index, and fixed expenses ratio. This discriminant function correctly classified 77 percent of the institutions as "strong" or "weak."

Among the 12 recommendations in Collier and Patrick's publication for the second year of this study were several that related specifically to the validation process. They realized that they had to significantly increase the number of institutions on which they had criterion information in order to cross-validate their discriminant analysis. It was also recommended that curvilinear relationships be explored in the discriminant function because it is possible that some of the non-discriminating indicators may exhibit non-linear relationships with the continuum of financial conditions. The authors wanted to investigate how well the hypothesized dimensions fit the underlying quantitative structure of the indicators.

Collier and Patrick's final recommendation involved the potential application of a technique not used in the cited literature--multidimensional scaling (mds). With mds, indicator profiles would be given to experts in financial analysis with the request to rate the similarity of the financial condition of every possible pair of institutions using the indicator profile. The ratings would then be used, the authors suggest, to infer the indicators that were most important to the expert judges in making their ratings.[9]

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[9] Collier and Patrick, p. 61.

## Chapter VI

## CONCLUSIONS

While all authors agree that fully satisfactory financial indicators are not yet available, many have found indicators sufficiently useful to employ them in decisionmaking. Many researchers are sufficiently confident of future success to continue their efforts. All agree that it will take several more years to have the kinds of indicators that were developed over decades of use and research for other industries.

The review has shown that the different purpose and uses for financial indicators have resulted in different sets of indicators. Once a particular purpose has been identified by an agency, concerns of timeliness, cost, and level of desired reliability have further influenced the particular methodologies for selecting the indicators, the data used for analysis, and the kind of techniques used to validate the findings.

Table 8 displays a possible sample of the choices that have been available to the various users. It can serve as a review of the reasons of different users for selecting different indicators. Along the horizontal axis are the goals of the principal users. To reach their goal, users have considered the most appropriate means available. Along the vertical axis are examples of those choices--the available theories, objective resources, and subjective expertise of the field.

The vertical axis also serves as a list of the major accomplishments of the period 1973 through 1978. At the beginning of the period, one theory of the educational firm paralleled that of the profit-oriented business sector. Improvements in the audit guidelines by AICPA

Table 8

### Review of Reasons for Selecting Different Indicators: Major Developments in Theoretical Frameworks, Data Sources and Expertise by Project Uses

| Uses / Developments | Public Sector | | | | Private Sector |
|---|---|---|---|---|---|
| | Determine Sector Viability | Identify Inst. Conditions | Evaluate Public Programs | Aid Inst. Management | Assess Investment Risks |
| 1. Conceptual Framework: | | | | | |
| Business Model | | Carroll | Harvard | | |
| Funds Acc. Model | Jenny (-Wynn) | Change | SCC | Robinson | SLMA |
| Cash-Flow Model | | | | Jenny 79 | |
| 2. Data Sources: | | | | | |
| HEGIS | NCFPE | NYTCFPE | Harvard | Wormley | |
| JMA | Minter-Bowen | ICUP | | | |
| Other | Lanier-Andersen | GAO | SCC | Anderson | DASNY |
| 3. Expertise: | | | | | |
| Original Effort | Jenny (-Wynn) | ICUP (Minter) | | Robinson | |
| Replicated Effort | NCFPE<br>Lanier-Andersen | NJCFPE<br>Collier-Patrick | Harvard<br>SCC | Truitt | SLMA |

were followed by similar adjustments to standardize the fund accounting model. At the close of this period, the possibility of cash-flow adequacies in long-term higher education finance was being studied.

The Higher Education General Information Survey became available in machine-readable form and with a revised financial format thereby increasing access and reliability of common data. In response to demands for more standardized and timely data, John Minter Associates audited financial statements and distributed an alternative database. Others, requiring answers to more specific policy questions, utilized unique surveys and assessments.

With attention focused on possible indicators for measuring the financial condition of colleges and universities, economists, business officers, and other analysts were able to gain experience to compare with the a priori conceptual models. Subsequently, this period marked advances generated by both individual and group efforts. With restrictions on time and/or cost, some studies replicated or elaborated upon earlier efforts or used an eclectic approach (ACE/NCES).

The "different-purposes-result-in-different-indicators" thesis may be illustrated by comparing the selected indicators for the cited studies of any two or more columns. The inflation indicators developed by Wynn and reported by Jenny are significantly different from those used by the authors of Change to report institutional conditions and those identified by Robinson, even though the same conceptual model was accepted by all users. On the other hand (going down a single column), principal users with the same intended use generally employed similar indicators. For example, Jenny (-Wynn) studied inflation indicators recommended by the National Commission and Lanier and Andersen replicated the Commission methodology with some variation.

This matrix is meant to be a tool for explanatory purposes and is subject to criticism of both internal and external validity (e.g., John Minter of JMA was the principal investigator of both Minter-Bowen and the ICUP study; consequently, the selected indicators are essentially the same). However, it may serve to account for the major differences between studies and to point out some of the gaps that may need to be filled before eventual consensus is reached.

A coherent theory and measurement technology are needed for this field. While diversity has been the reality of the recent past, unity is the vision of the leaders in this field. At the conclusion of the 1978 Working Conference on Measuring Financial Conditions of Colleges and Universities, an informal poll was conducted. The majority of presenters and participants consulted (including most of the authors cited), were willing to risk their reputations that generally accepted financial indicators will be developed.

A final analysis of the current status of the development and use of financial indicators for colleges and universities involves at least two critiera: consensus and confidence. Like the development of tools in other trades, analysis has progressed more than synthesis. With the exception of the Higher Education Price Index (HEPI), which has been widely used by many analysts, there are still no generally accepted standards of uniform criteria to determine the existence or extent of financial health among institutions of postsecondary education. There has, however, been a collective upsurge in the confidence in indicators used for specific purposes. As one leader in this field has frequently asserted, we are trying to telescope into a few years what it took industry decades to accomplish in indicator development.

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